MODEL

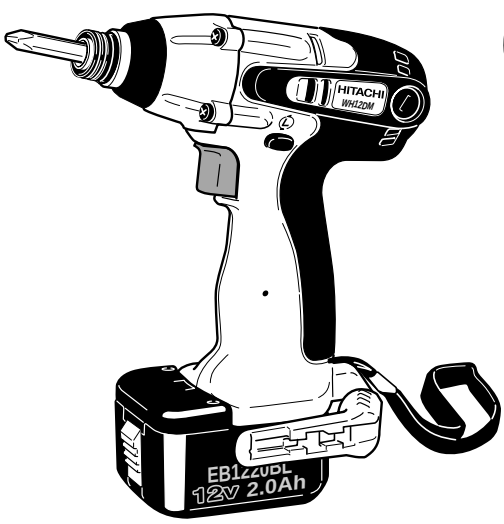
**WH 12DM**

**WR 12DM**

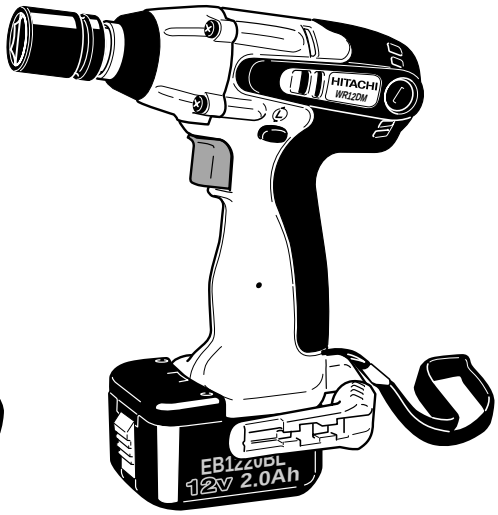
# HITACHI
## POWER TOOLS

# CORDLESS IMPACT DRIVER
# WH 12DM
# CORDLESS IMPACT WRENCH
# WR 12DM

**TECHNICAL DATA AND SERVICE MANUAL**




WH 12DM




WR 12DM

W

LIST Nos. WH 12DM: F862
WR 12DM: F864

Oct. 2001

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

WH 12DM

| Symbol Utilized | Competitor | |
|---|---|---|
| | Company Name | Model Name |
| C | MAKITA | 6916D |
| | | |
| | | |

WR 12DM

| Symbol Utilized | Competitor | |
|---|---|---|
| | Company Name | Model Name |
| C | MAKITA | 6918D |
| | | |
| | | |

**CONTENTS**

**Page**


**1. PRODUCT NAME ..... 1**

**2. MARKETING OBJECTIVE ..... 1**

**3. APPLICATIONS ..... 1**

**4. STANDARD EQUIPMENT ..... 1**

**5. SELLING POINTS ..... 2**

5-1. Selling Point Descriptions ..... 4

**6. SPECIFICATIONS ..... 14**

6-1. Specifications ..... 14

6-2. Optional Accessories ..... 15

**7. COMPARISONS WITH SIMILAR PRODUCTS ..... 18**

7-1. Specification Comparisons (Cordless Impact Driver) ..... 18

7-2. Specification Comparisons (Cordless Impact Wrench) ..... 19

7-3. Tightening Torque ..... 20

7-4. Tightening Speed ..... 23

7-5. Number of Screws or Bolts Driven ..... 24

7.6 Actual Noise When Tightening Wood Screws and Bolts ..... 25

**8. PRECAUTIONS IN SALES PROMOTION ..... 26**

8-1. Safety Instructions ..... 26

8-2. Tightening Torque Inspection Prior to Operation ..... 28

8-3. Tightening Torque Variation ..... 28

8-4. Suggestions and Precautions for the Efficient Use of the Charger ..... 29

**9. OTHER PRECAUTIONS ..... 30**

**10. REPAIR GUIDE ..... 31**

10-1. Precautions in Disassembly and Reassembly ..... 31

10-2. Precautions in Disassembly and Reassembly of Battery Charger ..... 38

**11. STANDARD REPAIR TIME (UNIT) SCHEDULES ..... 39**

Assembly Diagram for WH 12DM

Assembly Diagram for WR 12DM

## 1. PRODUCT NAME

Hitachi Cordless Impact Driver, Model WH 12DM

Hitachi Cordless Impact Wrench, Model WR 12DM

## 2. MARKETING OBJECTIVE

Owing to the shift of demand from nails to screws and increased demand for long screws, there is a market need for a powerful, high-speed, compact and easy-to-handle impact driver that provides more efficient operation per charge. The new cordless impact driver Model WH 12DM ("Super Impact 12") is the upgraded version of the previous Model WH 12DH, developed under the concept for more compact, powerful and convenient model to plainly differentiate it from the competitors. Thanks to the new development/production technologies such as computer analysis for optimum impacting operation and air ducts, 3-D CAD engineering and mold designing, double-layer molding, blow molding and the new rare-earth magnet motor, the Model WH 12DM provides the following features to respond to the user requests:

- 30% higher speed than the previous model
- High durability
- Comfortable handle grip
- Convenient functions including hook and bit holder
- New-type flat battery

The new cordless impact driver Model WH 12DM ("Super Impact 12") is the standard model of the Super Impact series. This "Super Impact 12" is expected to expand our market share of the cordless impact products. The new cordless impact wrench Model WR 12DM ("Super Wrench 12") is also brought out. The Model WR 12DM has the maximum tightening torque of 150 N•m. It is substantially higher than the previous Model WR 12DH and equivalent to the tightening torque of our higher-class 14.4-V cordless impact wrench.

## 3. APPLICATIONS

- Tightening/loosening of small screws, tapping screws, wood screws, bolts, nuts, etc.
- Drilling into wood and various other materials (with use of optional accessory drill chuck adapter).

**[Applicable Markets]**

- Wood-product assembly: Tightening/loosening of wood screws.
- Construction industry: Assembly of scaffolding, roofing, aluminum sashes, fencing, etc.; removal of plastic cones from concrete forms, mounting/removal of form ties; drilling into the wood frames of concrete forms, etc.
- Manufacturing industry: Assembly work for automobiles, rolling stock, shipbuilding, agricultural machinery and tools, industrial machines, steel furniture, etc.
- Utility industry: Assembly and installation of electric equipment, plumbing facilities, air conditioning (duct assembly, etc.), sanitary fixtures and various other facilities.
- Service industry: General repair work; installation of advertising aids, automobile repair, assembly of garages and carports storage sheds, etc.
- Various other assembly, construction or repair facilities.

## 4. STANDARD EQUIPMENT

The Models WH 12DM and WR 12DM come standard with the new-type flat battery.

(1) BL K specification: One EB 1220BL battery (NiCad, capacity 2.0 Ah), UC 14YF2 charger and case

(2) 2BLFK specification: Two EB 1220BL batteries (NiCad, capacity 2.0 Ah), UC 14YF2 charger and case

(3) HLFK specification: One EB 1230HL battery (NiMH, capacity 3.0 Ah), UC 14YF2 charger and case

(4) 2HLFK specification: Two EB 1230HL batteries (NiMH, capacity 3.0 Ah), UC 14YF2 charger and case

## 5. SELLING POINTS

(1) Cordless Impact Driver: WH 12DM

**Powerful**

**Ultra-compact body but class-top tightening speed**
(30% faster than the previous model, 10% faster than C)
Maximum torque 100 N•m, the same torque in forward/ reverse rotation

Enhanced maintainability
- Singly replaceable armature
- Replaceable carbon brushes

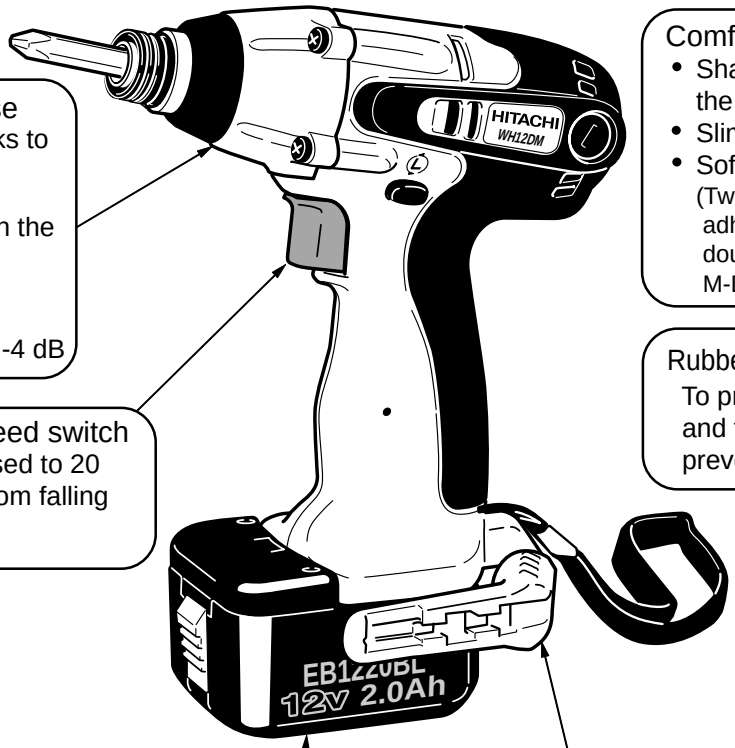
High durability
- High durability in continuous operation (improved cooling efficiency):
  Temperature rise is reduced to half of C thanks to the 1.4 times thicker winding (than C), powerful rare-earth magnet motor (made in Hitachi Koki), large fan and optimum air ducts.
- Improved dust resistance:
  Ball bearings with contact seals
  Labyrinth construction
- Long service life:
  The gears and the motor section are strengthened to realize powerful operation.

**Convenient**

Comfortable handle grip
- Shaped to comfortably fit the operator's thumb
- Slim grip
- Soft and slip-resistant grip
  (Two kinds of resins are firmly adhered by fusion in the new double-layer molding process, M-DSI)

Low operating noise
Powerful tightening thanks to the large hammer
Noise level of the Model WH 12DM compared with the previous model
- When tightening wood screws: -3 dB
- When tightening bolts: -4 dB

Rubber cap and soft material
To protect the main body and the workpiece, and to prevent slipping




Stepless variable speed switch
Startup speed is decreased to 20 rpm to prevent screws from falling sideways.

**New, compact and cyber design**

Overall length of the Model WH 12DM compared with the previous model
- Overall length: -9 mm
- Girth of housing: - 10 mm
- Height: - 19 mm
- Weight: - 80 g
- Handle angle is changed from 5˚ to 10˚ (easy to handle).

Convenient one-touch hook
- Quick slide-out hook (angle-adjustable)
- Mountable on either side
- Bit holder

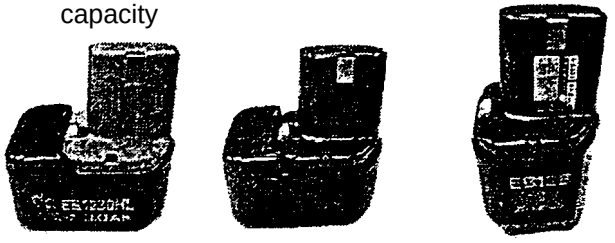
Patent applied for

Compact and stable flat battery
- Selectable from three types: high-capacity NiMH battery, light-weight NiMH battery and NiCad battery
- Conventional stand-up batteries (EB 12B, etc.) are also usable.

1.5 times higher capacity

NiCad

Conventional batteries are usable (B-type batteries).



Interchangeable

(2) Cordless Impact Driver: WR 12DM

**Powerful tightening torque 150 N•m (1530 kgf•cm, 1330 in-lbs.)**

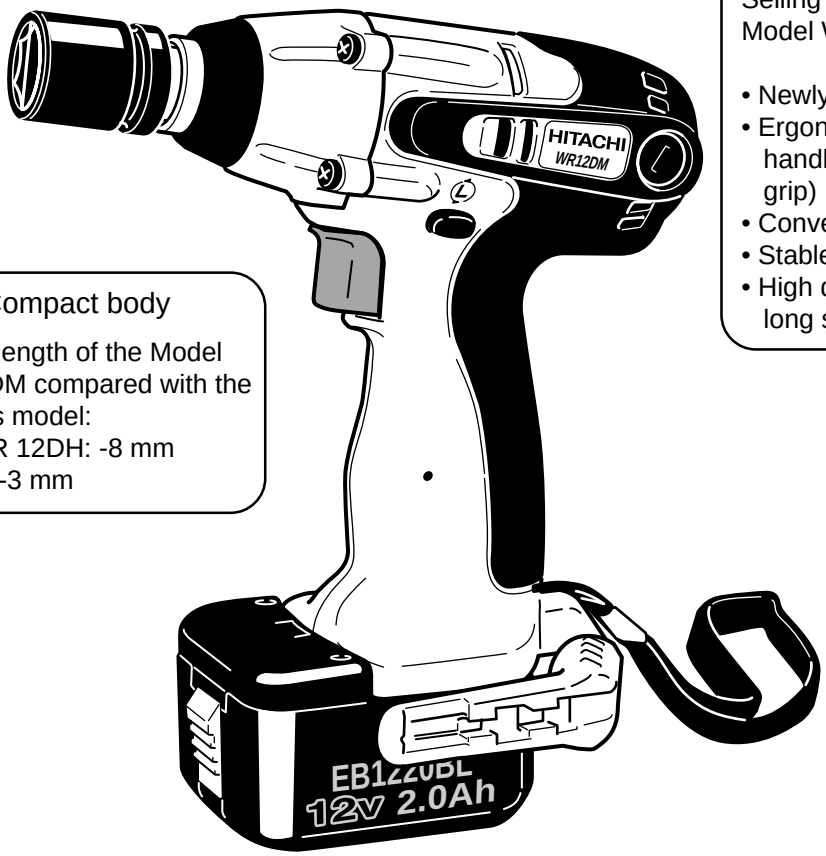
WR 12DH: 118 N•m (1200 kgf•cm, 1040 in-lbs.)
C: 120 N•m
WR 14DH (14.4-V product): 147 N•m (1500 kgf•cm, 1302 in-lbs.)

Selling points common to the Model WH 12DM

- Newly designed compact body
- Ergonomically designed comfortable handle (slip-resistant double-molded grip)
- Convenient one-touch hook
- Stable flat battery (interchangeable)
- High durability, dust resistance and long service life

Compact body

Overall length of the Model WR 12DM compared with the previous model:
WR 12DH: -8 mm
C: -3 mm



**5-1. Selling Point Descriptions**

Common selling points (Models WH 12DM and WR 12DM)

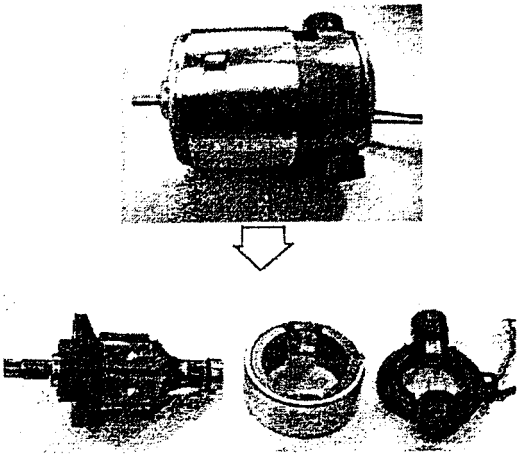
(1) New, compact and cyber design

The Models WH 12DM/WR 12DM have vibrant and cyber looks thanks to the widely adopted soft urethane resin (elastomer) and the complicated 3-D curved surfaces, stirring up curiosity to touch them.

○ The Models WH 12DM/WR 12DM are equipped with a separate-type motor in which the armature is separated from the magnet like a 100-V motor while the previous models are equipped with an integrated-type motor contained in a steel case. Thanks to the new separate-type motor, the steel case is eliminated and the motor section is downsized. In addition, the hammer case is downsized. The overall length of the Models WH 12DM/WR 12DM is shortened by 9 mm, the girth is shortened by 10 mm and the height is shortened by 19 mm in comparison with the previous models as shown below. The Models WH 12DM/WR 12DM are convenient for working in narrow places.

○ The weight of the Models WH 12DM/WR 12DM is heavier than C by about 80 g because they are equipped with the hook, and the gears and the motor are strengthened to enhance the durability and the performance.

○ The Models WH 12DM/WR 12DM are easy to handle and well balanced thanks to the change of the handle angle from 5˚ to 10˚ to cope with the user demand (C: 15˚). This is the optimum angle determined in the factory by making sample machines.

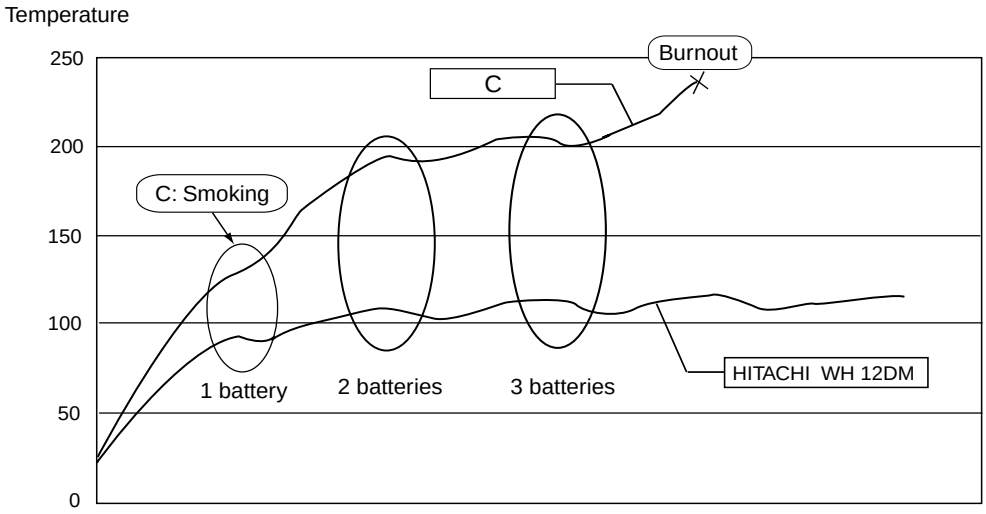


(2) High durability

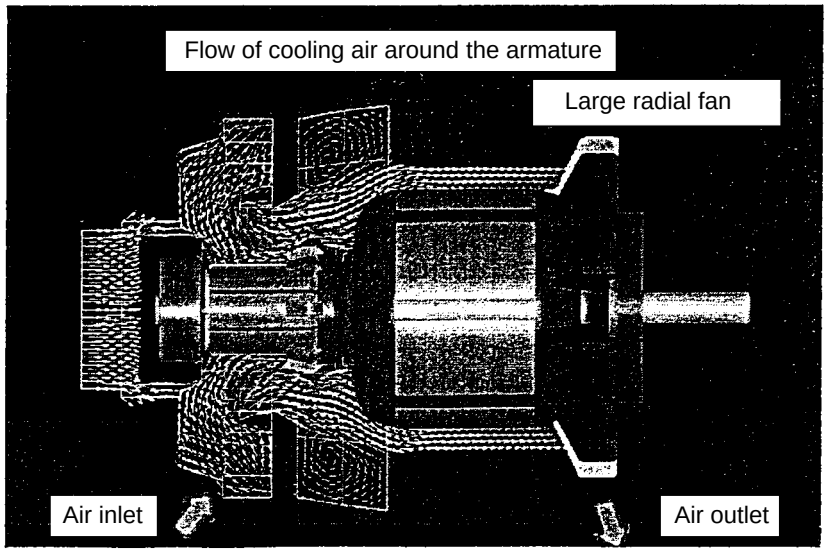
Owing to the shift of demand from nails to screws and increased demand for long screws, impact drivers having high heat resistance in continuous operation are much sought after. However, there are problems such as heavy noise or vibration of the ball bearings and decrease in power if the impact drivers are used harshly in dusty environments. In addition, higher strength and longer service life are required to continuously tighten and loosen bolts in scaffolding and demolishing works. The Models WH 12DM/WR 12DM have high durability, dust resistance and long service life in continuous operation as described below.

① Enhanced heat resistance of the motor (Example: When tightening M12 bolts continuously (Cycle of operation: 5-second impacting and 10-second stopping, 3.0 Ah battery used)

The heat resistance comparison between the Models WH 12DM/WR 12DM and C is shown below. The Models WH 12DM/WR 12DM are equipped with a powerful motor having 9% larger core diameter, 13% larger stacking length, 1.4 times thicker winding (2 times larger cross section of the conductor) and 33% larger volume of the armature than C. The cooling efficiency is improved and the temperature rise is reduced to half of C (when using two batteries) thanks to the powerful full-fledged large radial fan and the computer-analyzed air ducts. Thus the Models WH 12DM/WR 12DM are protected from burnout due to long-time continuous use and decrease in speed due to temperature rise. The motor is manufactured using the latest facilities in Yamagata Plant.

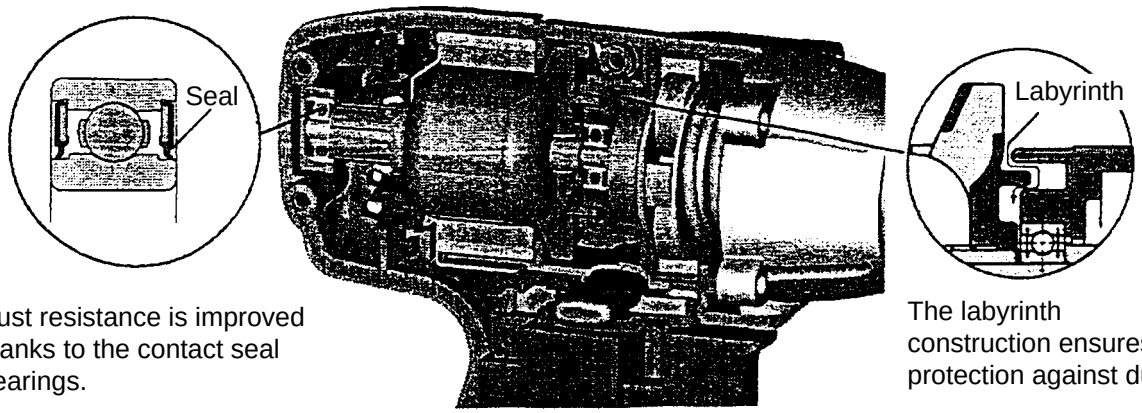



As shown in the above graph, C produces smoke when operating on one battery. When tightening wood screws (5.3 mm diameter and 120 mm long) into a workpiece (hemlock spruce) continuously, it suddenly takes much time to tighten the tenth and the later screws. This is because thin wires used in the armature assembly of C are apt to produce heat and the cooling construction is insufficient to reduce the heat.



② Improved dust resistance

The dust-resistant contact seal bearings are provided at the commutator side and the fan side. Thanks to the new bearings, hermeticity is enhanced because the seals of the bearings always contact the inner rings (C: non-contact bearings). The labyrinth construction is provided between the housing and the fan at the pinion side as shown in the figure below to ensure protection against dust because the pinion side must have high durability against heavy loads. The air inlet is minimized and the powerful fan discharges dust if entered.




Dust resistance is improved thanks to the contact seal bearings.

The labyrinth construction ensures protection against dust.

③ Improved service life and durability

Although the service life may vary depending on the frequency of use and the severity, the service life of the Models WH 12DM/WR 12DM is 1.5 times longer than C in spite of the compact body because the Models WH 12DM/WR 12DM have strong components such as the highly durable motor and the gears made of specially heat-treated steel to realize powerful operation.

(3) Convenient one-touch hook

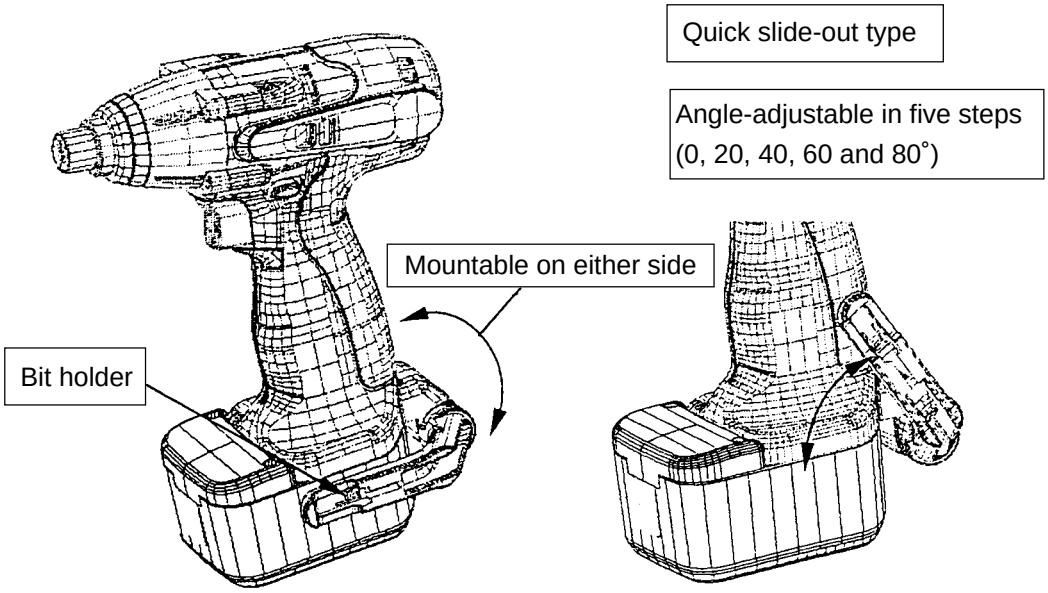
A hook is very convenient if there is no place to put the impact driver temporarily. Although various kinds of hooks are on the market, there is a user demand for a standard accessory hook. To cope with this demand, the Models WH 12DM/WR 12DM are equipped with the hook having the following features as a standard accessory.

① The hook can be quickly slid out and can be slid in when not needed.

② The hook is mountable on either side to cope with the use by either right-handed persons and left-handed persons. The mounting position can be changed by using a flat-blade screwdriver or a coin.

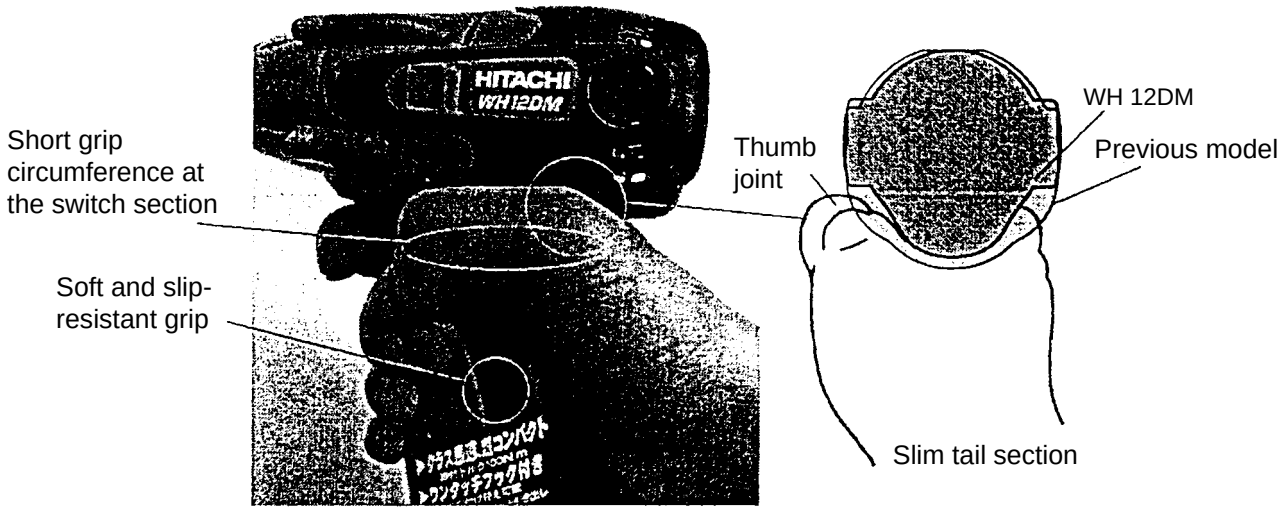
③ The angle of the hook is adjustable in five steps (0, 20, 40, 60 and 80˚). The hook can be adjusted to the optimum position according to the weight of the bit in use.

④ The bit holder that can contain a 65-mm double-ended bit is provided. It is very convenient for holding a spare bit.




(4) Ergonomically designed comfortable handle

- When the previous model is continuously operated, the housing tail rubs the base of the operator's thumb and gives pain to the operator. To cope with this problem, the Models WH 12DM/WR 12DM are equipped with the separate-type motor without case to make the housing tail section slim.
- More delicate speed control is required at the start of tightening screws. The Models WH 12DM/WR 12DM have a grip whose circumference at the switch section is shorter than C for ease of operation (grip circumference at the switch section with respect to C: -14 mm).
- The grip of the Models WH 12DM/WR 12DM is soft, slip-resistant and comfortable thanks to the soft resin (elastomer) covered on the handle. The new double-layer molding process, M-DSI (Multi-layered Die Slide Injection) is introduced to mold the nylon resin and the elastomer resin continuously in the same die. Since the elastomer resin is molded while the formerly molded nylon resin is still hot, they are adhered by fusion and the adhesion is so firm as to be torn if you try to remove the soft material layer from the nylon resin layer.




* M-DSI (Abbreviation of "Multi-layered Die Slide Injection")

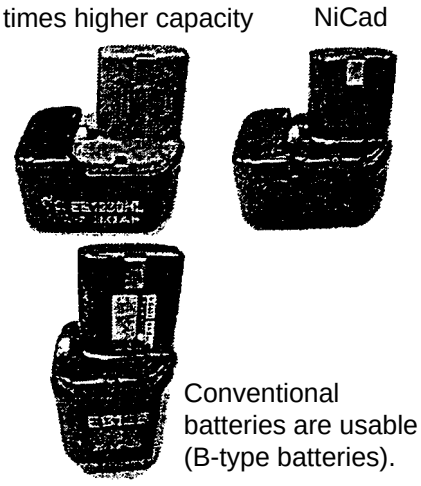
This is a molding process that allows the nylon resin and the elastomer resin to be molded continuously in the same die in a short cycle by sliding the die. The nylon resin and the elastomer resin are adhered by fusion because the nylon resin is covered with the elastomer resin while it is still hot, and thus the firm laminate can be made (manufactured using the latest facilities in Yamagata Plant).

(5) New flat battery (interchangeable)

There are user requests for a new cordless impact driver that can stand upright stably and can also be operated on the conventional batteries (chargers). The new flat batteries for the Models WH 12DM/WR 12DM have low height and wide bottom enough to stand the Models WH 12DM/WR 12DM upright and are interchangeable with the conventional stand-up batteries including EB 12B.

(6) Low operating noise (-3 dB with respect to the previous model)

Although the previous models give shrill noise, the operating noise of the Models WH 12DM/WR 12DM is low and dull thanks to the large hammer and the optimized impact timing without increasing the revolution. Thus the large hammer tightens screws powerfully with low operating noise. (Refer to page 25 for details.)




(7) Enhanced maintainability

The carbon brushes are replaceable and the armature is singly replaceable thanks to the separate-type motor like a 100-V motor.

(8) Others

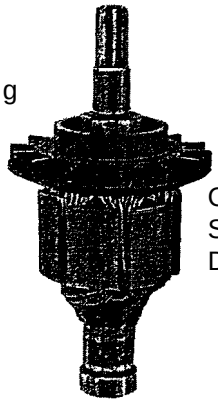
The Models WH 12DM/WR 12DM have the following features common to the previous models.

- The thickness of the silver plating over the terminal is changed from 3 μ to 30 μ (10 times thicker) for longer service life of the terminal. In addition, the terminal is movable according to the movement of the battery to prevent damage to the contact portion. The contact between the housing and the battery is changed from line contact to surface contact to minimize rattling due to wear.
- To cope with the initial galling of the anvil, a hardened-steel metal with an oil groove for retaining grease (C: powder-sintered, no groove) is provided at the tip and a dust-resistant seal is provided inside the metal (the effect has already been proved by the Model WH 12DC2).

  [Reference] Motor comparison of the Model WH 12DM with C is shown below. The Model WH 12DM is equipped with a powerful motor having 1.4 times thicker winding, larger core diameter and stacking length than C. In addition, the Model WH 12DM is equipped with the full-fledged fan having walls at both sides of a blade for powerful cooling while C's fan is simple with only the blades.

**HITACHI WH 12DM**

114 g



Outside diameter of core: 30.5 mm
Stacking length of core: 17.0 mm
Diameter of winding: 0.85 mm

**C**

87 g

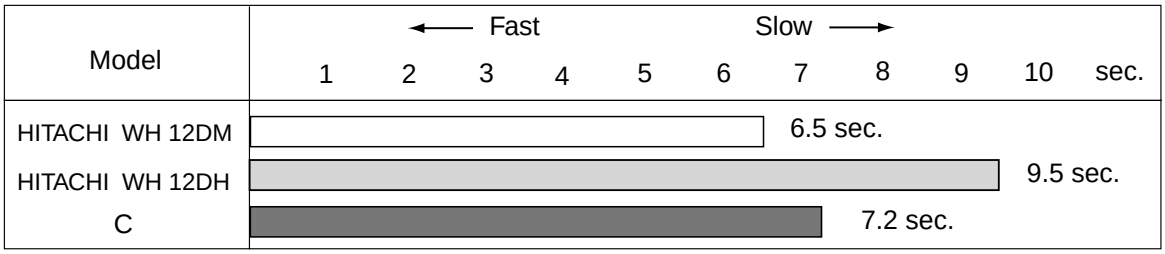
Outside diameter of core: 28.0 mm
Stacking length of core: 16.0 mm
Diameter of winding: 0.6 mm

Selling points of the Model WH 12DM

- Class-top tightening speed

  The Model WH 12DM is equipped with the new rare-earth magnet motor that is more powerful than the previous model by 30% and the 35% larger hammer. With the computer analysis, the Model WH 12DM gives optimum impact at tightening screws and the tightening speed is 30% higher than the previous model (10% higher than C). The Model WH 12DM can also tighten long screws at high speed even into a hard wood workpiece. Tightening time comparison of the Model WH 12DM with C is shown below. (Refer to pages 23 and later for detailed data on the tightening time and the working capacity.)

Tightening time comparison (Wood screw: 5.3 mm dia. x 120 mm length, hemlock spruce)




* Tightening time may vary depending on hardness of the workpiece, ambient temperature, characteristics of the battery, etc.

- Maximum tightening torque: 100 N•m {1020 kgf•cm, 885 in-lbs.}

  The Model WH 12DM is equipped with a powerful motor having 33% larger volume of the armature and 1.4 times thicker winding (2 times larger cross section of the conductor) than C to reduce temperature rise. Because the tightening torque is the same in both forward and reverse rotations, the tightening torque is not reduced even when loosening bolts (this is the same feature in the previous models). C's speed and tightening torque in reverse direction are lower than those in forward direction because the position of the motor brush is shifted to obtain high power with the small motor.

Selling points of the Model WR 12DM

- Powerful tightening torque 150 N•m {1530 kgf•cm, 1330 in-lbs.}

  The Model WR 12DM is equipped with the new rare-earth magnet motor that is more powerful than the previous model by 30% and the 35% larger hammer. With the computer analysis, the Model WR 12DM gives optimum impact at tightening bolts and the tightening torque is 27% higher than the previous Model WR 12DH, 25% higher than C, and equivalent to the 14.4 V-product Model WR 14DH. The Model WR 12DM is mechanically strong thanks to the high-strength components such as the 30% stronger anvil and the specially heat-treated gears to realize powerful operation. Data of measured tightening torque are shown below.

(1) Tightening torque comparison

It should be noted that a M16 F10T bolt was tightened in 3 seconds with a hexagon socket (40 mm long) in the test. The tightening torque of the Model WR 12DM is substantially higher than the previous model.

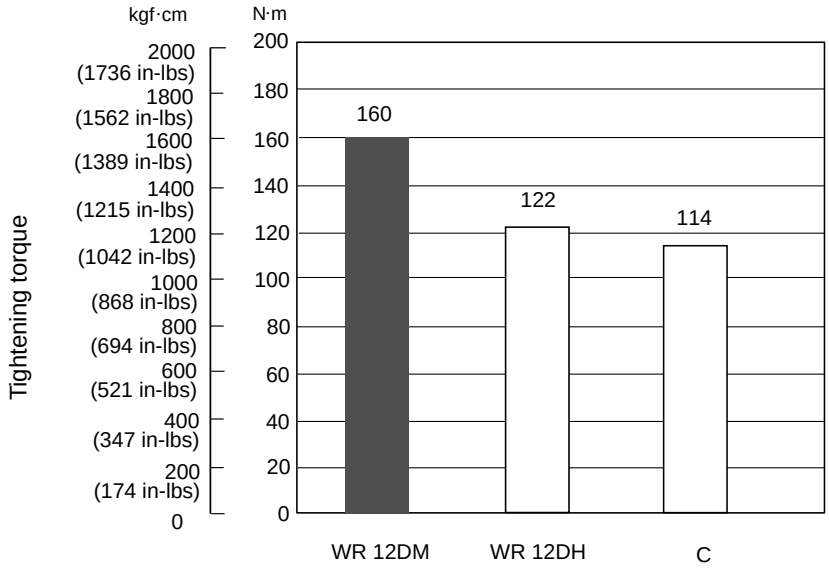



**Fig. 1**

* The data above are intended for reference purposes only because actual tightening torque will vary depending on tightening conditions.

To describe the merit of high tightening torque, the comparison data among the Model WR 12DM, the previous Model WR 12DH and C are shown in Figures 2 and 3. Figure 2 shows the time required for loosening a high strength bolt and Figure 3 shows the time required for sinking a square washer into a wood workpiece.

(2) Loosening time comparison (high strength bolts)

Figure 2 shows the time comparison when loosening an M16 bolt that was statically tightened at 200 N•m {2040 kgf•cm, 1770 in-lbs.} with a torque wrench. The Model WR 12DM can loosen an M16 bolt in a half time of the previous Model WR 12DH. In addition, the Model WR 12DM can loosen bolts that cannot be loosened by the previous Model WR 12DH. It is very convenient for loosening bolts that secure molding boxes.

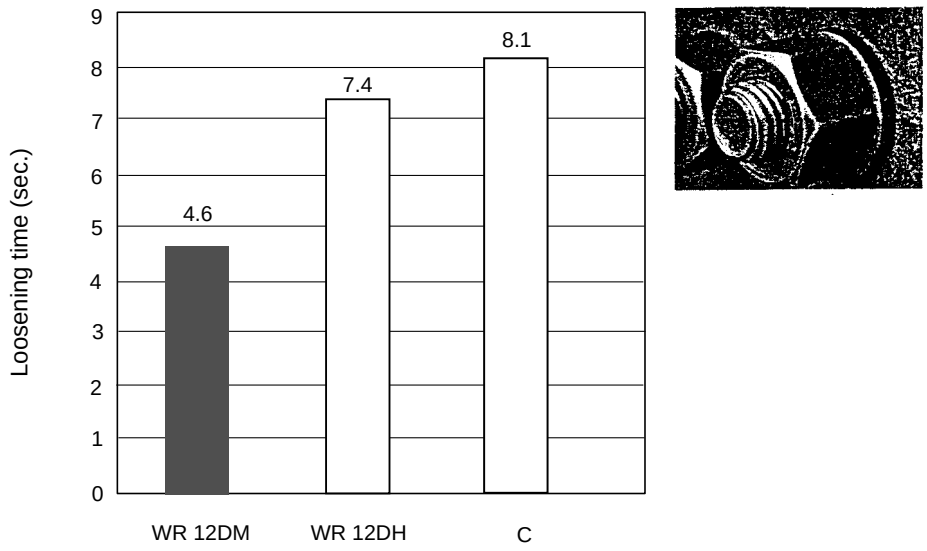



**Fig. 2**

*The data above are intended for reference purposes only because actual loosening torque will vary depending on tightening conditions.

(3) Sinking time comparison (square washers)

Figure 3 shows the time required for tightening an M12 bolt into a pine laminated lumber of 105 mm square until the square washers at both sides are sunk into the lumber by 1.3 mm respectively. The Model WR 12DM can tighten strap bolts and corner bracings (used in Japanese wooden buildings) speedily as it can sink washers into a workpiece quickly.

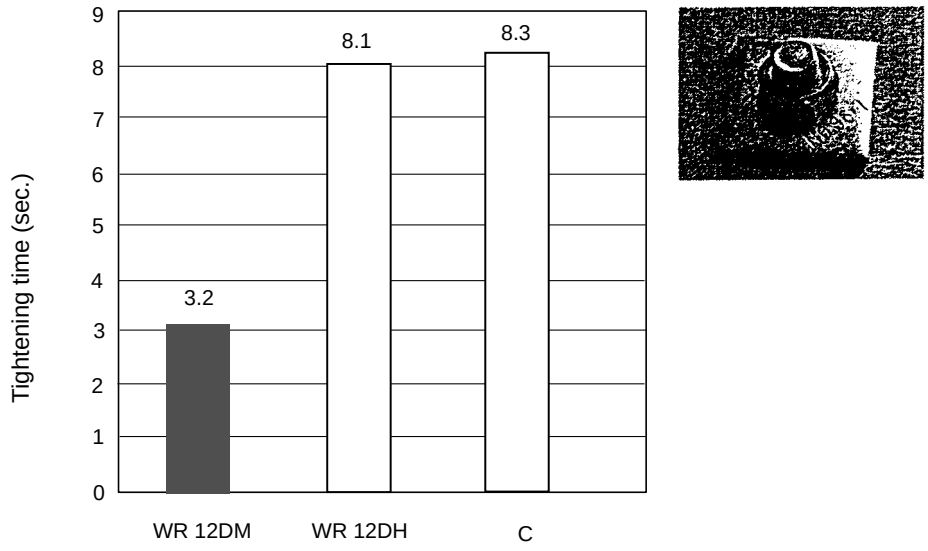


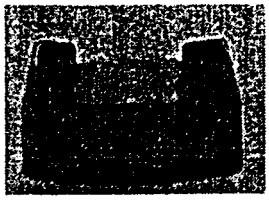

**Fig. 3**

*The data above are intended for reference purposes only because actual time required for sinking washers will vary depending on tightening conditions.

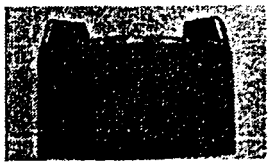
The 30% higher power motor and the 35% larger hammer are the main factors that increase the tightening torque of the Model WR 12DM substantially. Comparison of hammer and number of strokes are shown below.

(4) Comparison of hammer and number of strokes

Thanks to the larger hammer (higher hammer inertia J) than the previous model, the number of strokes (N) of the Model WR 12DM is increased. As a guide, stroking force is proportional for J X $N^2$. Therefore, when the J X $N^2$ of the Model WR 12DH is 100, the J X $N^2$ of the Model WR 12DM is about 1.5 times larger than the Model WR 12DH as shown in the table below.



WR 12DM



WR 12DH

C

| Model | Unit | WH 12DM | WR 12DM | C |
|---|---|---|---|---|
| Voltage | V | 12 | 12 | 12 |
| Outside diameter of hammer (D) | mm | 42.6 | 39.5 | 42 |
| Height of hammer (H) | mm | 20 | 21 | 16.5 |
| Hammer inertia J | $kgmm^2$ | 37.4 | 28.8 | 31.7 |
| Number of strokes (N) | $min^{-1}$ (No. of strokes/min.) | 3140 | 2900 | 3070 |
| J x $N^2$ | % | 150 | 100 | 120 |

## 6. SPECIFICATIONS

### 6-1. Specifications

| Item \ Model | | Cordless Impact Driver WH 12DM | Cordless Impact Wrench WR 12DM |
|---|---|---|---|
| Capacity | | Small screw M4 ─ M8 (5/32" ─ 5/16")*1<br>Ordinary bolt M5 ─ M12 (3/16" ─ 15/32") | Ordinary bolt M6 ─ M16 (1/4" ─ 5/8")<br>High-strength bolt M6 ─ M12 (1/4" ─ 15/32") |
| Tightening torque | | 100 N·m (1020 kgf·cm, 885 in-lbs.)*2 | 150 N·m (1530 kgf·cm, 1330 in-lbs.)*3 |
| Tip condition | | 6.35 mm (1/4") Bit holder | 12.7 mm (1/2") Square drive |
| Type of motor | | Fan cooled rare-earth magnet motor | |
| Enclosure | | Main body: Polyamide resin + elastomer ····· Housing<br>Aluminum alloy die casting ····· Hammer case<br>Storage battery: ABS resin (black)<br>Charger: ABS resin (black) | |
| Type of switch | | Trigger switch with forward/reverse changeover pushing button (with brake) | |
| Handle configuration | | T-type | |
| No-load rotational speed | | 0 ─ 2,300 /min | |
| Impact rate | | 0 ─ 3,000 /min | |
| Weight | Main body | 1.6 kg (3.5 lbs.) (Includes battery)*4 | |
| | Battery | 0.68 kg (1.5 lbs.) | |
| Overall length x height | | 167 mm (6-37/64") x 226 mm (8.9") | 173 mm (6-13/16") x 226 mm (8.9") |
| Center height | | 26 mm (1-1/64") | |
| Battery<br>(Type EB 1220BL) | | Sealed cylindrical nickel-cadmium batteries<br>Nominal voltage: DC 12V<br>Nominal life: Charging/discharging approximately 1,000 cycles<br>(in case of Model UC 14YF2)<br>Nominal capacity: 2.0 Ah | |
| Battery<br>(Type EB 1230HL) | | Sealed cylindrical nickel-metal hydride batteries<br>Nominal voltage: DC 12V<br>Nominal life: Charging/discharging approximately 500 cycles<br>(in case of Model UC 14YF2)<br>Nominal capacity: 3.0 Ah | |
| Charger (UC 14YF2) | | Charger power source: single-phase AC, 50/60 Hz<br>Voltage: Depending on the order specification<br>Power input: 44 W<br>Charging system: Constant current charge with full wave phase control<br>Overcharge protection system: (1) Battery voltage detection (△$^2$V system)<br>(2) Battery surface temperature detection<br>(thermostat or thermistor)<br>(3) 120-minute timer<br>Output voltage: 7.2 V ─ 14.4 V<br>Output current: 1.9 A<br>Charging time: Approx. 60 minutes (for BL-type storage battery at 20 ˚C)<br>Approx. 90 minutes (for HL-type storage battery at 20 ˚C)<br>Product weight: 1.3 kg<br>Operable ambient temperature range: 0 ˚C ─ 40 ˚C<br>The maximum allowable temperature of the EB 1220BL type battery is 60 ˚C and the EB 1230HL type battery is 45 ˚C. | |

*1: In the case of tapping screws and wood screws, a minimum of M3 (1/8") is possible.
*2: This torque is based on tightening an M12 (15/32") bolt (strength grade: 12.9) for 3 seconds with a hexagonal socket.
*3: This torque is based on tightening an M16 (5/8") bolt (F10T) for 3 seconds with a hexagonal socket.
*4: Main body does not include accessory tools (hexagonal bit, etc.).

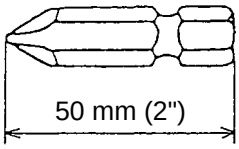
Pilot lamp indications (Model UC 14YF2)

| | | | | |
|---|---|---|---|---|
| Red pilot lamp remains lit or flashes. | Prior to charging | Blinks | 0.5 sec ON, 0.5 sec OFF | |
| | During charging | Lit | Stays ON constantly | |
| | Charging completed | Blinks | 0.5 sec ON, 0.5 sec OFF | |
| | Charging not possible | Flickers | 0.1 sec ON, 0.1 sec OFF | Storage battery or charger is faulty. |
| Green pilot lamp is lit. | High battery temperature | Lit | Stays ON constantly | Charging not possible because storage battery temperature is too high. |

### 6-2. Optional Accessories

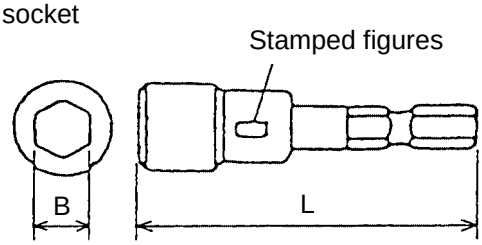
(1) Optional accessories for the Model WH 12DM

- Plus driver bit



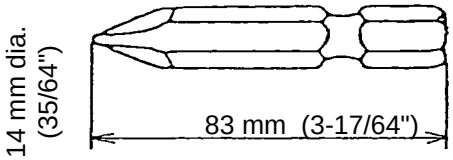

| Bit No. | Code No. |
|---|---|
| No. 2 | 992671 |
| No. 3 | 992672 |

- Hexagon socket



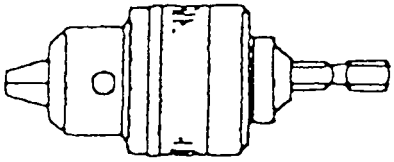

| Part name | Stamped figures | L (mm) | B (mm) | Code No. |
|---|---|---|---|---|
| 5 mm Hexagon socket | 8 | 65 (2-9/16") | 8 (5/16") | 996177 |
| 6 mm Hexagon socket | 10 | 65 (2-9/16") | 10 (3/8") | 985329 |
| 5/16" Hexagon socket | 12 | 65 (2-9/16") | 12 (15/32") | 996178 |
| 8 mm Hexagon socket | 13 | 65 (2-9/16") | 13 (1/2") | 996179 |
| 10 mm Hexagon socket (small type) | 14 | 65 (2-9/16") | 14 (9/16") | 996180 |
| 10 mm Hexagon socket | 16 | 65 (2-9/16") | 16 (5/8") | 996181 |
| 10 mm Hexagon socket | 17 | 65 (2-9/16") | 17 (21/32") | 996182 |
| 1/2" Hexagon long socket | 21 | 166 (6-17/32") | 21 (53/64") | 996197 |

- Woodworking drill bit (Code No. 959183)



• Drill chuck adaptor set (Code No. 996195)

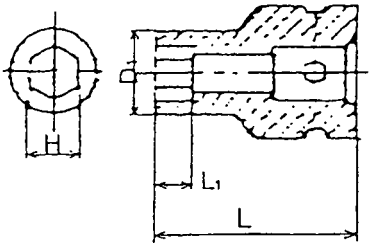
The drill chuck adaptor set permits mounting of various types of locally-available drill bits for a variety of drilling operations.



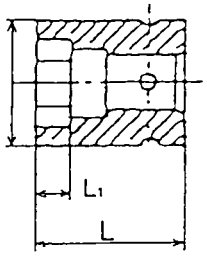
(2) Optional accessories for the Model WR 12DM

• Each dimension and applicable bolt for each hexagon socket

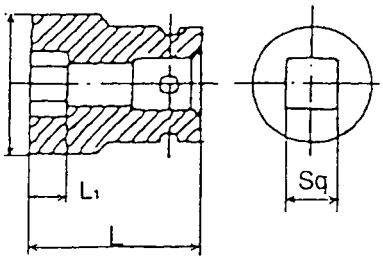
Shape B




Shape C



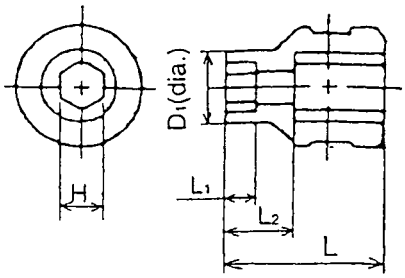

Shape D



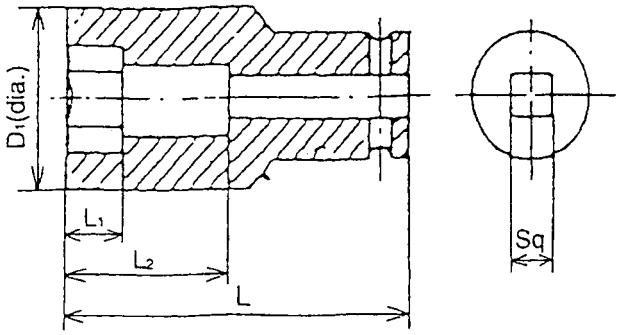

| Square drive dimension Sq | Part name | | Code No. | Nominal diameter of applicable bolts | | | | Dihedral width H (mm) | Shape | Socket primary dimensions (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ISO (High-strength) | ISO (Ordinary) | ISO (Small type) | Inch screw | | | L | $L_1$ | $D_1$ |
| 12.7 mm (1/2") | Hexagon socket | 10 mm | 944291 | — | M 6 (1/4") | — | — | 10 (3/8") | B | 40 (1-9/16") | 8 (5/16") | 18 (23/32") |
| | | 12 mm | 873632 | — | — | M 8 (5/16") | W 5/16" | 12 (15/32") | B | 40 (1-9/16") | 8 (5/16") | 20 (25/32") |
| | | 13 mm | 873539 | — | M 8 (5/16") | — | — | 13 (1/2") | B | 40 (1-9/16") | 9 (11/32") | 25 (1") |
| | | 14 mm | 873540 | — | — | M 10 (3/8") | — | 14 (9/16") | B | 40 (1-9/16") | 9 (11/32") | 25 (1") |
| | | 17 mm | 873536 | — | M 10 (3/8") | M 12 (15/32") | W 3/8" | 17 (21/32") | C | 32 (1-1/4") | 8 (5/16") | 28 (1-3/32") |
| | | 19 mm | 873624 | — | M 12 (15/32") | M 14 (9/16") | W 7/16" | 19 (23/32") | C | 34 (1-11/32") | 9 (11/32") | 28 (1-3/32") |
| | | 21 mm | 873626 | — | — | — | W 1/2" | 21(53/64") | D | 36 (1-13/32") | 10 (3/8") | 32 (1-1/4") |
| | | 22 mm | 873627 | M 12 (15/32") | M 14 (9/16") | M 16 (5/8") | — | 22 (7/8") | D | 40 (1-9/16") | 14 (9/16") | 35 (1-3/8") |
| | | 24 mm | 873629 | | M 16 (5/8") | M 18 (23/32") | | 24 (15/16") | D | 40 (1-9/16") | 15 (9/16") | 38 (1-1/2") |

• Each dimension and applicable bolt for each long socket

Shape B

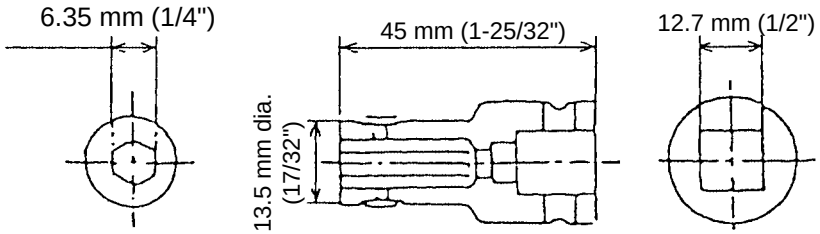



Shape D



| Square drive dimension Sq | Part name | | Code No. | Nominal diameter of applicable bolts | | | | Dihedral width H (mm) | Shape | Socket primary dimensions (mm) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ISO (High-strength) | ISO (Ordinary) | ISO (Small type) | Inch screw | | | L | $L_1$ | $L_2$ | $D_1$ |
| 12.7 mm (1/2") | Long socket | 12 mm | 955138 | — | — | M 8 (5/16") | W 5/16" | 12 (15/32") | B | 52 (2-3/64") | 20 (25/32") | 34(1-11/32") | 20 (25/32") |
| | | 13 mm | 955139 | — | M 8 (5/16") | — | — | 13 (1/2") | B | 52 (2-3/64") | 20 (25/32") | 34(1-11/32") | 21.5 (53/64") |
| | | 14 mm | 955140 | — | — | M 10 (3/8") | — | 14 (9/16") | B | 52 (2-3/64") | 20 (25/32") | 34(1-11/32") | 22 (7/8") |
| | | 17 mm | 955141 | — | M 10 (3/8") | M 12 (15/32") | W 3/8" | 17 (21/32") | B | 52 (2-3/64") | 24 (15/16") | 34(1-11/32") | 25 (1") |
| | | 17 mm | 955149 | — | M 10 (3/8") | M 12 (15/32") | W 3/8" | 17 (21/32") | B | 75 (2-15/16") | 24 (15/16") | 57(2-1/4") | 25 (1") |
| | | 19 mm | 955142 | — | M 12 (15/32") | M 14 (9/6") | W 7/16" | 19 (23/32") | B | 52 (2-3/64") | 24 (15/16") | 34(1-11/32") | 28 (1-3/32") |
| | | 19 mm | 955150 | — | M 12 (15/32") | M 14 (9/6") | W 7/16" | 19 (23/32") | B | 75 (2-15/16") | 24 (15/16") | 57(2-1/4") | 28 (1-3/32") |
| | | 21 mm | 955143 | — | — | — | W 1/2" | 21 (53/64") | D | 52 (2-3/64") | 24 (15/16") | 34(1-11/32") | 31 (1-7/32") |
| | | 21 mm | 955151 | — | — | — | W 1/2" | 21 (53/64") | D | 75 (2-15/16") | 24 (15/16") | 57(2-1/4") | 31 (1-7/32") |
| | | 21 mm | 991480 | — | — | — | W 1/2" | 21 (53/64") | D | 125 (4-47/51") | 24 (15/16") | 107 (4-7/32") | 31 (1-7/32") |
| | | 22 mm | 955144 | M 12 (15/32") | M 14 (9/16") | M 16 (5/8") | — | 22 (7/8") | D | 52 (2-3/64") | 24 (15/16") | 34(1-11/32") | 32.5 (1-9/32") |
| | | 24 mm | 955146 | — | M 16 (5/8") | M 18 (23/32") | | 24 (15/16") | D | 52 (2-3/64") | 25 (63/64") | 34(1-11/32") | 34 (1-11/32") |

• Bit adaptor (Code No. 991476)




| Part name | Overall length (mm) | Code No. |
|---|---|---|
| Plus hd. driver bit No.2 | 45 (1-25/32") | 955229 |
| | 70 (2-3/4") | 955654 |
| Plus hd. driver bit No.3 | 45 (1-25/32") | 955230 |
| | 70 (2-3/4") | 955655 |

• Extension bar [Overall length 100 mm (3-15/16") ] (Code No. 873633)
• Universal joint (Code No. 992610)
• Socket ass'y for duct

| Dihedral width of applicable bolts | Code No. |
|---|---|
| 12 (15/32") | 993658 |
| 13 (1/2") | 992613 |
| 14 (9/16") | 992615 |

• EW-14R corner attachment (Code No. 9329-9001)

## 7. COMPARISONS WITH SIMILAR PRODUCTS

### 7-1. Specification Comparisons (Cordless Impact Driver)

| Item \ Maker | | | | HITACHI | | C |
|---|---|---|---|---|---|---|
| Item \ Model | | | | WH 12DM | WH 12DH | |
| Catalog specifications | Capacity | Small screw | | M 4 – M 8 (5/32" – 5/16")*1 | M 4 – M 8 (5/32" – 5/16")*1 | M 4 – M 8 (5/32" – 5/16") |
| | | Ordinary bolt | | M 5 – M 12 (3/16" – 15/32") | M 5 – M 12 (3/16" – 15/32") | M 5 – M 12 (3/16" – 15/32") |
| | | High-strength bolt | | M 5 – M 10 (3/16" – 3/8") | M 5 – M 10 (3/16" – 3/8") | M 5 – M 10 (3/16" – 3/8") |
| | Max. tightening torque*2 | | N·m | 100 (1020 kgf·cm, 885 in-lbs.) | 98 (1000 kgf·cm, 868 ft-lbs.) | 100 (1020 kgf·cm, 885 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,300 | 0 – 2,200 | 0 – 2,300 |
| | Impact rate | | /min | 0 – 3,000 | 0 – 3,000 | 0 – 3,000 |
| | Main body weight*3 | | kg | 1.6 (3.5 lbs.) | 1.7 (3.7 lbs.) | 1.5 (3.3 lbs.) |
| Measured figures | Max. tightening torque*2 | | N·m | 112 (1140 kgf·cm, 990 in-lbs.) | 105 (1070 kgf·cm, 930 in-lbs.) | 109 (1110 kgf·cm, 965 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,390 | 0 – 2,180 | 0 – 2,750 |
| | Impact rate | | /min | 0 – 2,800 | 0 – 2,900 | 0 – 2,660 |
| | Overall length x height | | mm | 167 x 226 (6-37/64" x 8.9") | 176 x 245 (6-15/16" x 9-21/32") | 168 x 231 (6-39/64" x 9-3/32") |
| | Center height | | mm | 26 (1-1/64") | 26 (1-1/64") | 26 (1-1/64") |
| | Main body weight*3 | | kg | 1.66 (3.7 lbs.) | 1.73 (3.8 lbs.) | 1.58 (3.5 lbs.) |
| | No-load sound pressure level | | dB(A) | 69 | 69 | 71 |
| Tool tip mounting system | | | | Driver chuck | Driver chuck | Driver chuck |
| Type of switch | | | | Variable speed switch with forward/reverse changeover lever | Variable speed switch with forward/reverse changeover lever | Variable speed switch with forward/reverse changeover lever |
| Type of motor | | | | DC magnet | DC magnet | DC magnet |
| Voltage | | | V | 12 | 12 | 12 |
| Current | | | A | 28 | 17 | 26 |
| Battery | Type | | | EB 1220BL or EB 1230HL | EB 12B or EB 12H | 1222 |
| | Nominal capacity | | Ah | EB 1220BL: 2.0<br>EB 1230HL: 3.0 | EB 12B: 2.0<br>EB 12H: 3.0 | 2.0 |
| | Nominal voltage | | V | 12 | 12 | 12 |
| | Ambient temperature | | ˚C | 0 – 40 | 0 – 40 | — |
| Charger | Model | | | UC 14YF2 | UC 14YF or UC 14YF2 | DC1411 |
| | Power input capacity | | VA | 44 | 44 | — |
| | Recharging voltage | | V | 7.2 – 14.4 | 7.2 – 14.4 | 7.2 – 14.4 |
| Standard accessories | | | | • Plastic tool case<br>• Charger (UC 14YF2) | • Plastic tool case<br>• Charger (UC 14YF or UC 14YF2) | • Plastic tool case<br>• Charger |

*1: In the case of tapping screws and wood screws, a minimum of M3 (1/8") is possible.
*2: Max. tightening torque is based on tightening an M12 (5/32") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.
*3: Main body weight does not include accessory tools (hexagon bit, etc.).

### 7-2. Specification Comparisons (Cordless Impact Wrench)

| Item \ Maker / Model | | | | HITACHI WR 12DM | HITACHI WR 12DH | C |
|---|---|---|---|---|---|---|
| Catalog specifications | Capacity | Ordinary bolt | | M 6 – M 16 (1/4" – 5/8") | M 6 – M 14 (1/4" – 9/16") | M 8 – M 14 (5/16" – 9/16") |
| | | High-strength bolt | | M 6 – M 12 (1/4" – 15/32") | M 6 – M 10 (1/4" – 3/8") | M 6 – M 12 (1/4" – 15/32") |
| | Max. tightening torque | | N·m | 150*1 (1530 kgf·cm, 1330 in-lbs.) | 117.6*2 (1200 kgf·cm, 1040 in-lbs.) | 120*2 (1224 kgf·cm, 1060 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,300 | 0 – 2,200 | 0 – 2,300 |
| | Impact rate | | /min | 0 – 3,000 | 0 – 3,000 | 0 – 3,000 |
| | Main body weight | | kg | 1.6 (3.5 lbs.) | 1.7 (3.7 lbs.) | 1.6 (3.5 lbs.) |
| Measured figures | Max. tightening torque*1 | | N·m | 160 (1630 kgf·cm, 1415 in-lbs.) | 122 (1245 kgf·cm, 1080 in-lbs.) | 114 (1160 kgf·cm, 1005 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,390 | 0 – 2,180 | 0 – 2,750 |
| | Impact rate | | /min | 0 – 2,800 | 0 – 2,900 | 0 – 3,070 |
| | Overall length x height | | mm | 173 x 226 (6-13/16" x 8.9") | 180 x 245 (7-1/8" x 9-21/32") | 176 x 231 (6-15/16" x 9-3/32") |
| | Center height | | mm | 26 (1-1/64") | 26 (1-1/64") | 26 (1-1/64") |
| | Main body weight*3 | | kg | 1.67 (3.7 lbs.) | 1.73 (3.8 lbs.) | 1.60 (3.5 lbs.) |
| | No-load sound pressure level | | dB(A) | 69 | 69 | 71 |
| Tip condition | | | | 12.7 mm (1/2") Square drive | 12.7 mm (1/2") Square drive | 12.7 mm (1/2") Square drive |
| Tool tip mounting system | | | | Plunger | Plunger | — |
| Type of switch | | | | Variable speed switch with forward/reverse changeover lever | Variable speed switch with forward/reverse changeover lever | Variable speed switch with forward/reverse changeover lever |
| Type of motor | | | | DC magnet | DC magnet | DC magnet |
| Voltage | | | V | 12 | 12 | 12 |
| Current | | | A | 28 | 17 | 22 |
| Battery | Type | | | EB 1220BL or EB 1230HL | EB 12B or EB 12H | 1222 |
| | Nominal capacity | | Ah | EB 1220BL: 2.0<br>EB 1230HL: 3.0 | EB 12B: 2.0<br>EB 12H: 3.0 | 2.0 |
| | Nominal voltage | | V | 12 | 12 | 12 |
| | Ambient temperature | | ˚C | 5 – 40 | 5 – 40 | — |
| Charger | Model | | | UC 14YF2 | UC 14YF or UC 14YF2 | DC1411 |
| | Power input capacity | | VA | 44 | 44 | — |
| | Recharging voltage | | V | 7.2 – 14.4 | 7.2 – 14.4 | 7.2 – 14.4 |
| Standard accessories | | | | • Plastic tool case<br>• Charger (UC 14YF2) | • Plastic tool case<br>• Charger (UC 14YF or UC 14YF2) | • Plastic tool case<br>• Charger |

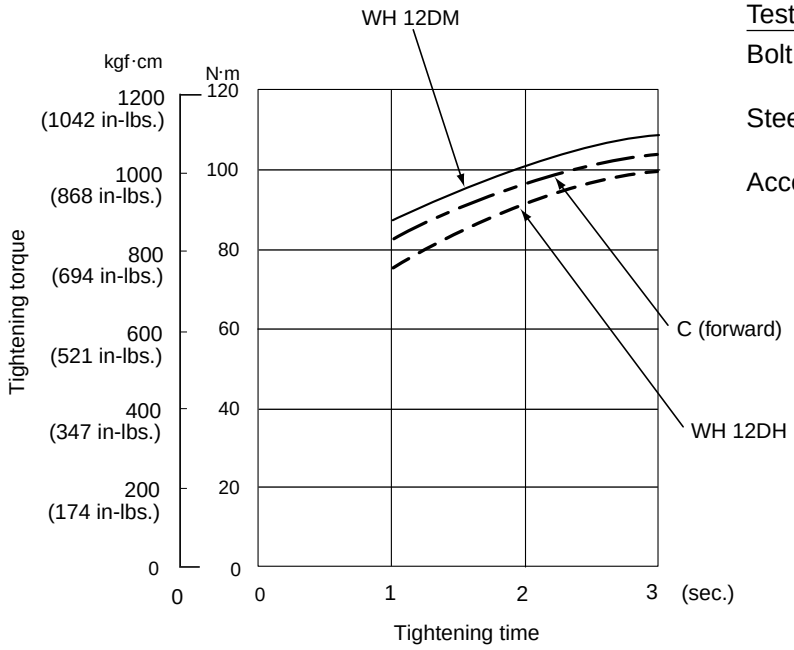
*1: Max. tightening torque is based on tightening an M16 (5/8") bolt (F10T) for 3 sec. with a hexagon socket.
*2: Max. tightening torque is based on tightening an M14 (9/16") bolt (strength grade: 12.9) for 3 sec. with a hexagon socket.
*3: Main body weight does not include accessory tools (hexagon bit, etc.).

### 7-3. Tightening Torque

#### 7-3-1. Tightening torque characteristic comparisons

Thanks to the high-power rare-earth magnet motor and the larger hammer inertia, the Models WH 12DM/ WR 12DM can provide greater tightening torque.

(1) Impact driver

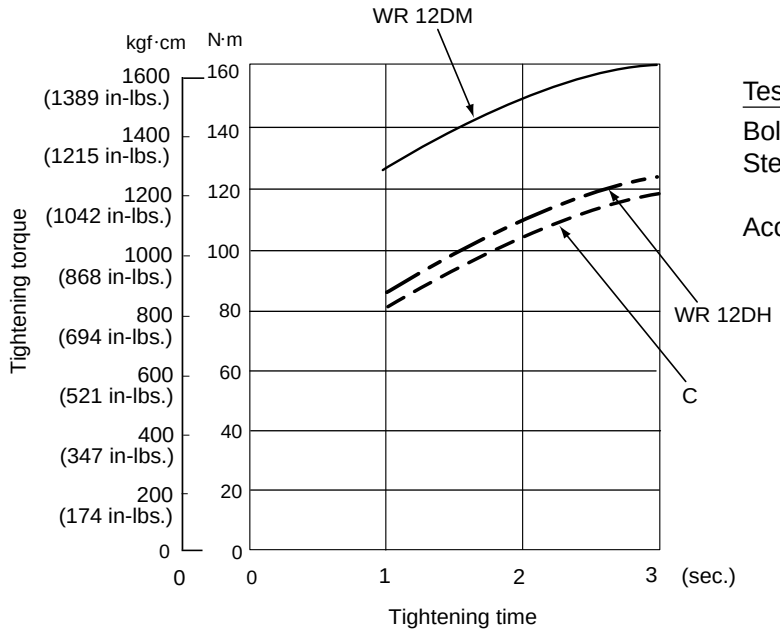



Test conditions

Bolt: M12 x 45 mm (15/32" x 1-25/32")
(strength grade: 12.9)
Steel plate: Mild steel
Thickness = 25 mm (1")
Accessory tool: Hexagon socket

**Fig. 4-1**

(2) Impact wrench




Test conditions

Bolt: M16 x 55 mm (5/8" x 2-5/32") (F10T)
Steel plate: Mild steel
Thickness = 25 mm (1")
Accessory tool: Hexagon socket ass'y

**Fig. 4-2**

**7-3-2. Screw diameter and appropriate tightening torque**

Generally speaking, the appropriate tightening torque for a screw can be determined by the strength grade of the screw and the material tightened. Tables 1 and 2, and Fig. 5 below list data relative to the strength grade of various screws and the appropriate tightening torque. For further reference, appropriate tightening torque is calculated with the following formula. Study and use this formula for accurate selection of tightening torque.

$T=k \cdot d \cdot p$

T: Appropriate tightening torque (kgf·cm)

d: Nominal diameter for the screw (mm)

p: Recommended axial tightening force to be applied to the screw (kgf)

p=rated axial stress (kgf/cm$^2$) x 0.8 x effective sectional area of the thread (mm$^2$)

k: Torque coefficient (0.17)

• Strength grade and rated axial stress of threads

**Table 1**

| Strength grade | 4.8 | 6.8 | 8.8 | 12.9 |
|---|---|---|---|---|
| Rated axial stress (kgf/mm$^2$) | 29.1 | 43.7 | 58.2 | 95 |
| Material | Mild steel | | Alloy steel including Ni, Mn, Cr, etc. | |
| Heat treatment | None | | Processed-hard material | |

• Diameter and effective sectional areas of threads

**Table 2**

| Kind of thread (x pitch) | M5 x 0.8 mm (3/16") | M6 x 1 mm (1/4") | M8 x 1.25 mm (5/16") | M10 x 1.5 mm (3/18") | M12 x 1.75 mm (15/32") | M14 x 2 mm (9/16") | M16 x 2 mm (5/8") |
|---|---|---|---|---|---|---|---|
| Effective sectional area of thread (mm$^2$) | 14.2 | 20.1 | 36.6 | 58.0 | 84.3 | 115 | 157 |

• Thread diameter and appropriate tightening torque

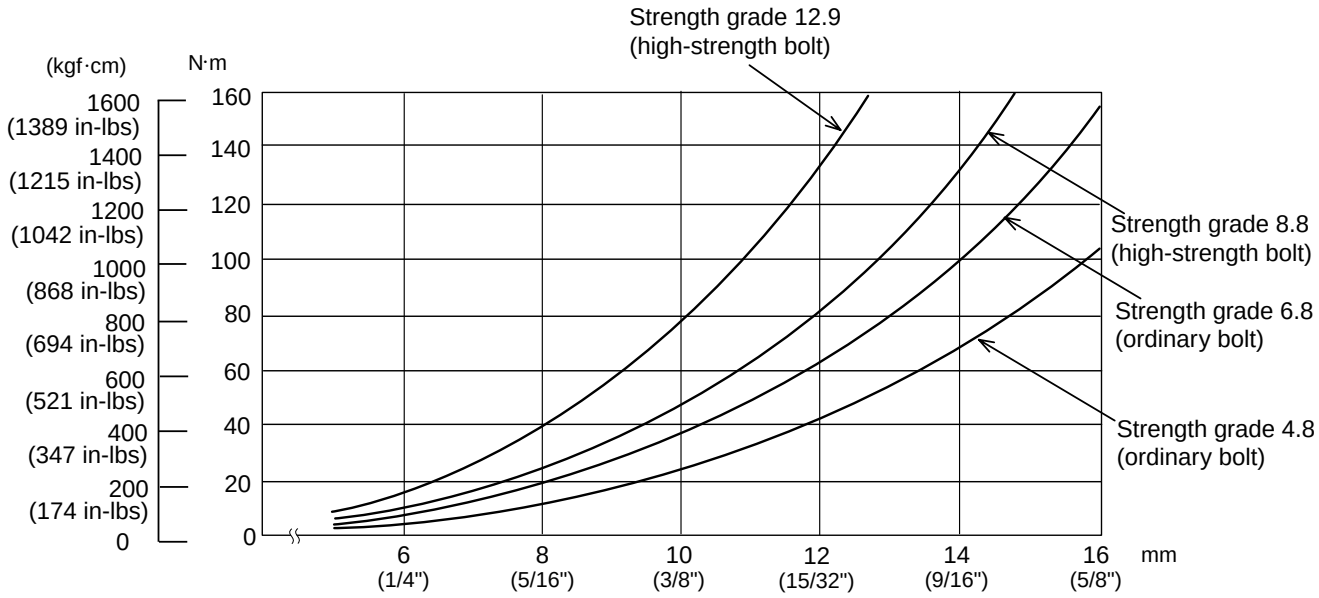


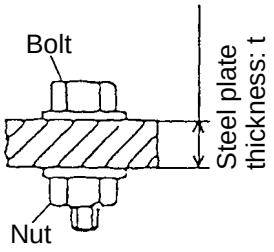

**Fig. 5**

**7-3-3. Bolt Tightening torque characteristics**

Figures. 6-1 and 6-2 show relationships between time and tightening torque for individual bolt types and sizes. While the data are useful for handy reference, actual tightening torque will vary depending on tightening conditions and other variables. For details, please refer to Para. 8-3, "Tightening Torque Variation".

**(Note)**

- The term "tightening time" indicates the impact time after the lower surface of the bolt has come in contact with the material into which it is being tightened.
- In the tightening conditions shown in Figs. 6-1 and 6-2, the screws are being tightened directly into a steel plate; accordingly, the torque goes up very abruptly in comparison with ordinary bolt tightening conditions.




* The following bolts were utilized:
Ordinary bolt; strength grade 4.8
High-strength bolt; strengh grade 12.9

Strength grade is read as follows:

4.8
- Yield point or durable force: (45,500 psi)
- Tensile strength of the bolt: (56,900 psi)

- Model WH 12DM

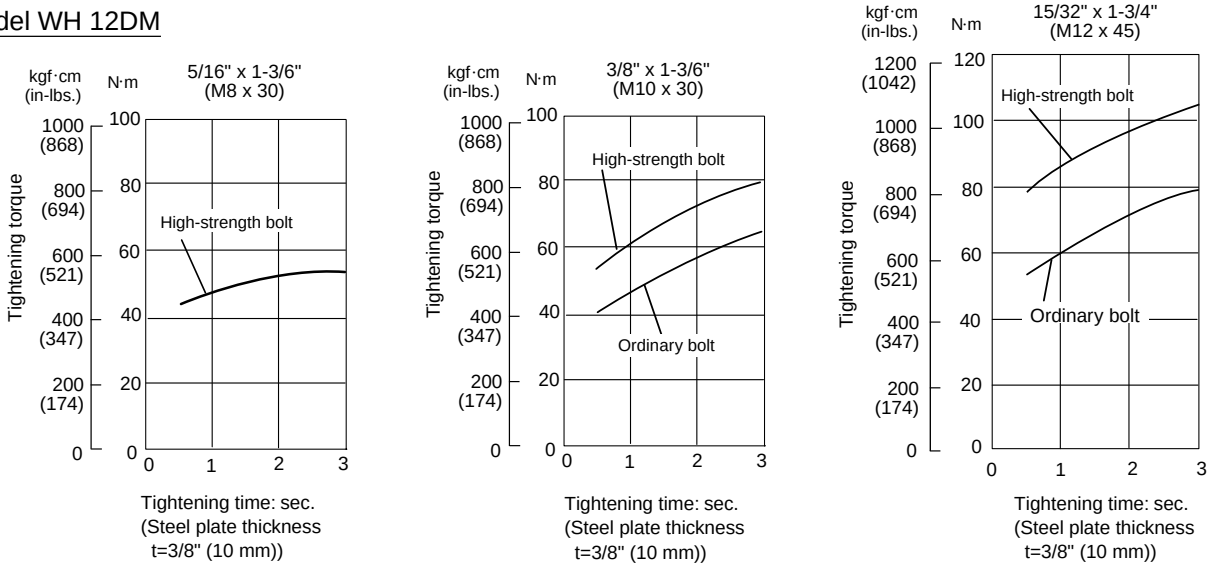



**Fig. 6-1**

- Model WR 12DM

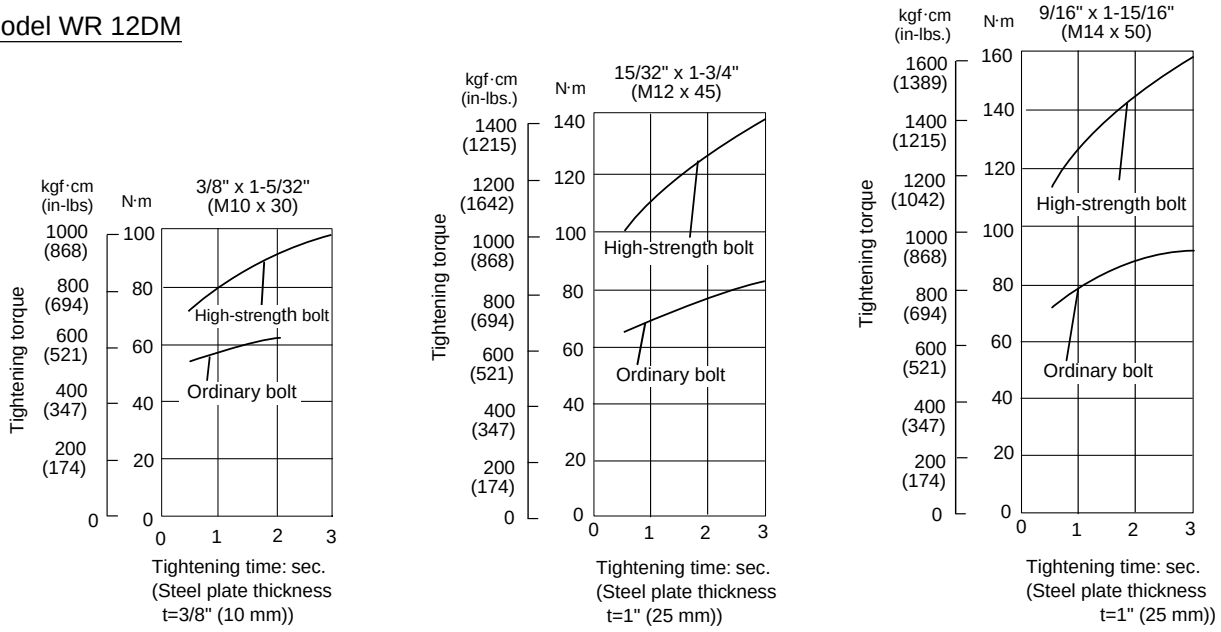


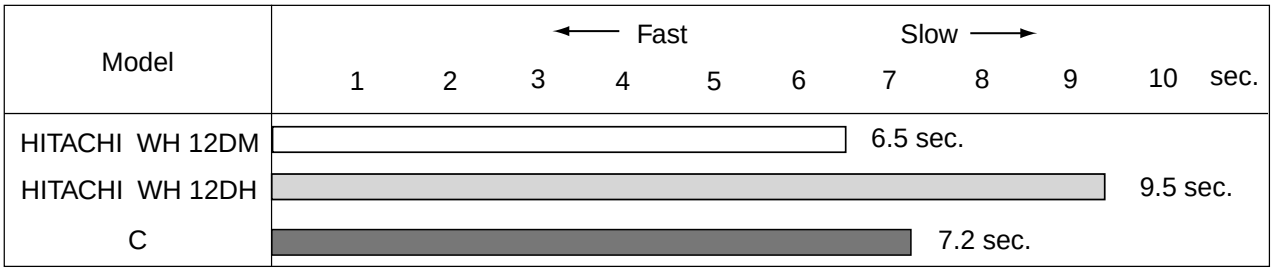

**Fig. 6-2**

**7-4. Tightening Time**

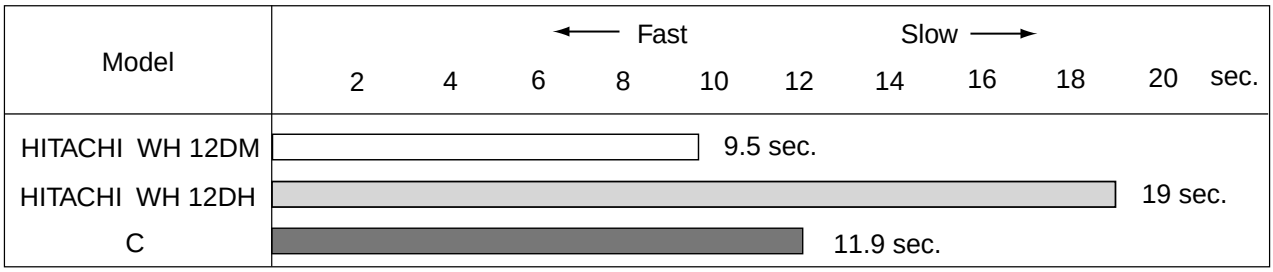
Thanks to the new 30% higher power rare-earth magnet motor, the 35% larger hammer and the computer analysis, the Model WH 12DM gives optimum impact at tightening screws and the tightening speed is 30% higher than the previous model. Tightening time comparison is shown below.

The data below are intended for reference purposes only because actual tightening time will vary depending on hardness of the workpiece, ambient temperature, characteristics of the battery, etc.

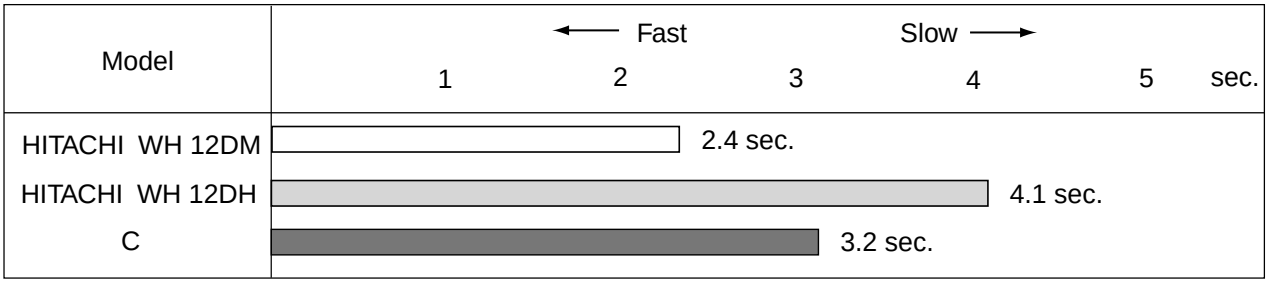
① Wood screw 5.3 mm dia. x 120 mm length, hemlock spruce



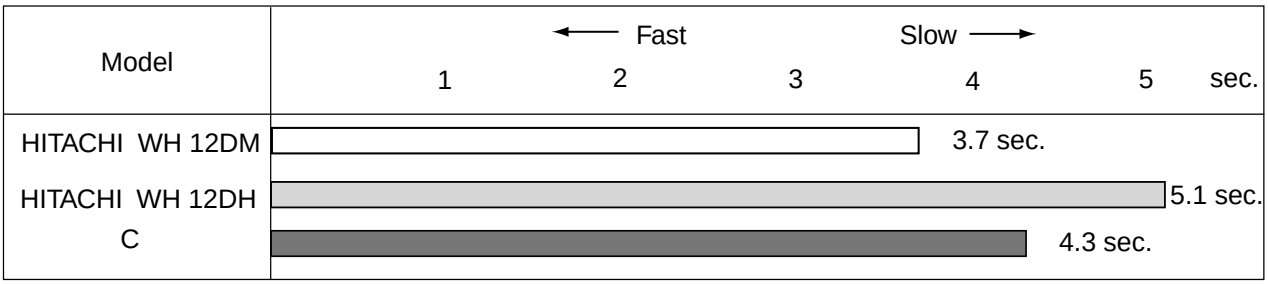

② Wood screw 5.3 mm dia. x 120 mm length, lauan




③ Wood screw 4.5 mm dia. x 90 mm length, hemlock spruce




④ Wood screw 4.5 mm dia. x 90 mm length, lauan



### 7-5. Number of Screws or Bolts Driven

#### 7-5-1. Per-charge working capacity comparisons

Test data on the number of screws or bolts which can be driven per battery charge by the new models vs. the previous models are shown in the tables below. Please note that the data below are intended for general reference only as the number of screws which can be tightened per charge will vary slightly depending on screw tightening conditions, screw sizes, ambient temperatures and the charging capacity of the battery.

(1) Number of screws or bolts driven (Cordless impact driver)

| Tightening condition \ Model | HITACHI WH 12DM | HITACHI WH 12DH | C |
|---|---|---|---|
| Battery | EB 1220BL | EB 12B | 1222 (Corresponding EB 1220BL) |
| Wood screw 4.0 mm dia. x 50 mm (soft wood) | 575 | 545 | 635 |
| Wood screw 4.2 mm dia. x 90 mm (hard wood) | 115 | 110 | 105 |
| Wood screw 5.3 mm dia. x 120 mm (hard wood) | 45 | 40 | 40 |
| Machine screw (M8 x 16 mm) | 1,280 | 1,215 | 1,475 |

Note 1) The Model WH 12DM is equipped with the larger hammer and the higher power motor for the higher tightening speed. Although the higher tightening speed is realized, the Model WH 12DM has the following disadvantage.

- High startup current

  The Model WH 12DM consumes higher power than C for driving a short or machine screw because it requires high startup current. Thus the number of machine screws driven per charge is different as shown above.

(2) Ordinary bolt (Cordless impact wrench)

| Tightening condition \ Model | | HITACHI WR 12DM | HITACHI WR 12DH |
|---|---|---|---|
| Battery | | EB 1220BL | EB 12B |
| M10 (3/8") ordinary bolt | Number of bolts | 755 | 755 |
| | Time (sec.) | 0.4 | 0.5 |
| M12 (15/32") ordinary bolt | Number of bolts | 475 | 475 |
| | Time (sec.) | 0.6 | 0.8 |
| M14 (9/16") ordinary bolt | Number of bolts | 335 | 335 |
| | Time (sec.) | 0.9 | 1.2 |

### 7.6 Actual Noise When Tightening Wood Screws and Bolts

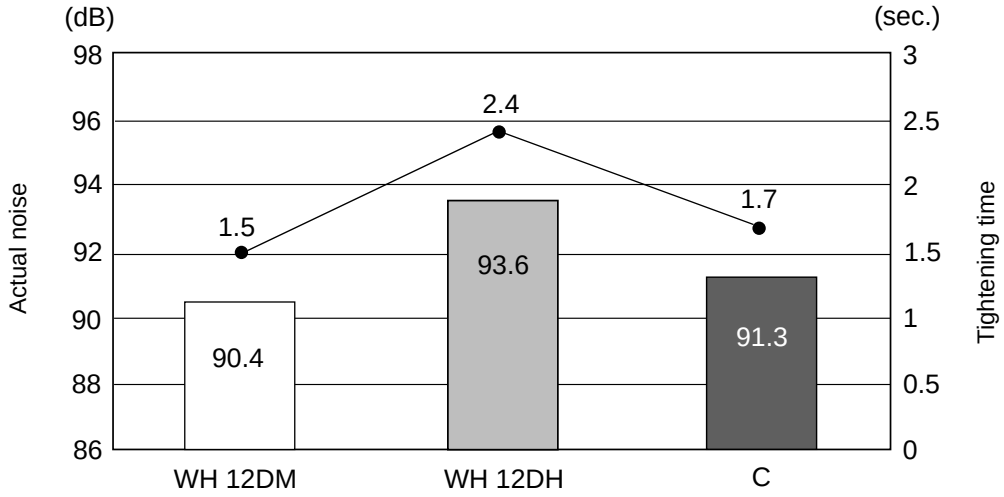
(1) Actual noise when tightening wood screws

The comparison data when tightening a wood screw (4.5 mm in diameter and 90 mm in length) into a cedar workpiece are shown below. The data below are intended for reference purposes only because actual noise will vary depending on the types of workpieces, hardness, etc.

Measuring conditions: (a) Wood screws (4.5 mm in diameter and 90 mm in length) and cedar workpieces

(b) Battery voltage 12 V, A-range, distance 1 m

(c) Average of tightening 5 screws

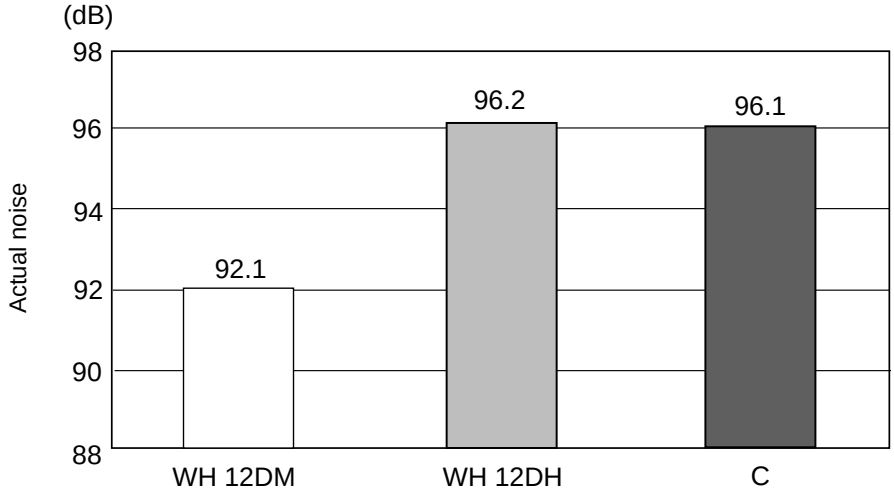



(2) Actual noise when tightening bolts

Measuring conditions: (a) M12 bolts

(b) Battery voltage 12 V, A-range

(c) Average of tightening 5 screws



## 8. PRECAUTIONS IN SALES PROMOTION

### 8-1. Safety Instructions

In the interest of promoting the safest and most efficient use of these tools by all our customers, it is very important that at the time of sale the salesperson carefully ensures that the buyer seriously recognizes the importance of the contents of the Handling Instructions, and fully understands the meaning of the precautions listed on the Caution Plate and Name Plate attached to each tool.

#### A. Handling Instructions

Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to give pertinent advice to the customer. In particular, they must have a thorough understanding of the precautions in the use of the cordless (battery charger type) electric power tools which are different from those of ordinary electric power tools.

(1) Before use, ensure that the unit is fully charged.
New units are not fully charged. Even if the units were fully charged at the factory, long periods without use, such as during shipping, cause the storage battery to lose its charge. Customers must be instructed to fully charge the unit prior to use.

(2) When charging storage batteries, use only the exclusive Model UC 14YF2 Charger provided with the tool.
Because of the designed rapid-charging feature (about one hour), use of other battery chargers is hazardous.

(3) Follow prescribed steps in using the charger.
First connect the EB 12 Storage Battery to the Model UC 14YF2 Charger, then plug the charger into an AC outlet (ensuring that the voltage matches that indicated on the unit). If this order is reversed, the charger may not function properly.

(4) Ensure the power source voltage is the same as that indicated on the Name Plate of the charger. Use of any other power source (DC outlet, fuel powered generator, etc.) will cause the charger to overheat and burn out.

(5) Do not use any voltage increasing equipment (transformer, etc.) between the power source and the charger.
If the charger is used with voltage over and above that indicated on the unit, it will not function properly.

(6) Conduct battery charging at an ambient temperature range of 0 ˚C ─ 40 ˚C (32 ˚F ─ 104 ˚F).
Special temperature sensitive devices are employed in the charger to permit rapid charging. Ensure that customers are instructed to use the charger at the indicated ambient temperature range. At temperatures under 0 ˚C (32 ˚F), the thermostat will not function properly, and the storage battery may be over-charged. At temperatures over 40 ˚C (104 ˚F), the storage battery cannot be sufficiently charged. The optimum temperature range is 20 ˚C ─ 25 ˚C (68 ˚F ─ 77 ˚F).

(7) The battery charger should not be used continuously.
At high ambient temperatures, if over three storage batteries are charged in succession, the temperature of the coils on the transformer will rise and there is a chance that the temperature fuse inserted in the interior of the transformer will inadvertently melt. After charging one battery, please charge the next battery after about a fifteen-minute interval.

(8) The charger case is equipped with air vents to protect the internal electronic components from overheating.
Caution the customer not to allow foreign materials, such as metallic or flammable objects, to be dropped or inserted into the air vents. This could cause electric shock, fire or other serious hazards.

(9) Do not attempt to disassemble the storage battery or the charger.

Special devices, such as a thermostat, are built into the storage battery and charger to permit rapid charging. Incorrect parts replacement and/or wiring will cause malfunctions which could result in fire or other hazards. Instruct the customer to bring these units to an authorized service center in the event repair or replacement is necessary.

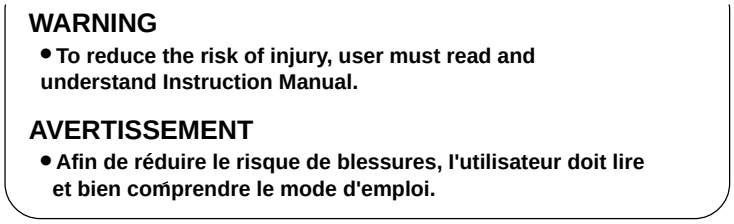
(10) Disposal of the Type EB 1220BL or EB 1230HL Storage Battery

Ensure that all customers understand that Type EB 1220BL or EB 1230HL Storage Batteries should be turned into any Hitachi power tool sales outlet or authorized service center when they are no longer capable of being recharged or repaired. If thrown into a fire, the batteries may explode, or if discarded indiscriminately, leakage of the cadmium compound contained in the battery may cause environmental pollution.

**B. Caution Plates**

(1) The following precautions are listed on the Name Plate or Caution Plate attached to the main body of each tool.

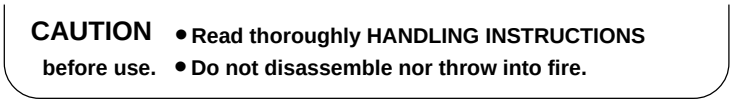
For the U.S.A. (excludes French) or Canada


WARNING
• To reduce the risk of injury, user must read and understand Instruction Manual.
AVERTISSEMENT
• Afin de réduire le risque de blessures, l'utilisateur doit lire et bien comprendre le mode d'emploi.

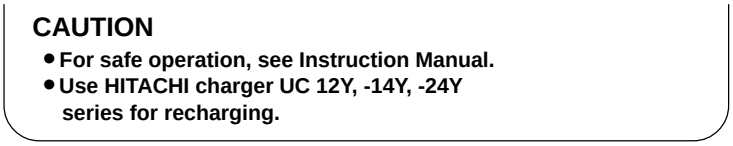
For Oceania

(2) The following cautions are listed on the Name Plate attached to each type EB 1220BL or EB 1230HL storage battery.

For Europe

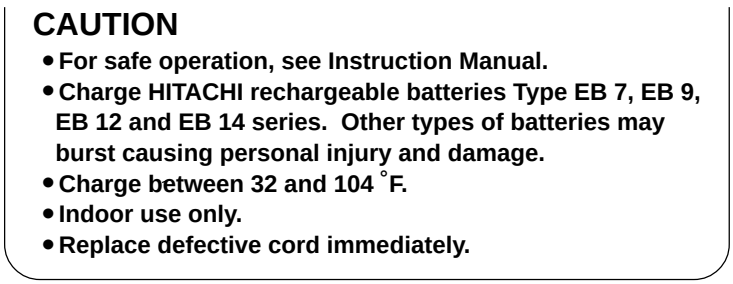



For the U.S.A.




(3) The following caution is listed on the Name Plate attached to the Model UC 14YF2 Charger.

For the U.S.A.


CAUTION
• For safe operation, see Instruction Manual.
• Charge HITACHI rechargeable batteries Type EB 7, EB 9, EB 12 and EB 14 series. Other types of batteries may burst causing personal injury and damage.
• Charge between 32 and 104 °F.
• Indoor use only.
• Replace defective cord immediately.

**8-2. Tightening Torque Inspection Prior to Operation**

As described and shown in Para. 7-3-3, the output tightening torque of which the Models WH 12DM and WR 12DM are capable in excess of the rated tightening torque of certain bolts and screws. Accordingly, if the tightening time is prolonged for such bolts and screws, it could cause damage to their threads or, in the worst case, cause them to be sheared off. (This phenomenon is common to all existing impact drivers.) Particularly when tightening M6 (1/4") or smaller screws, tightening time must be kept extremely short: 0.5 seconds or less. The customer should be advised to carry out several screw tightening operations and adjust the tightening time as necessary by measuring the tightening torque with an appropriate torque wrench or driver before commencing continuous operation.

**8-3. Tightening Torque Variation**

The tightening torque of the cordless impact driver or wrench may vary slightly in accordance with the factors described below. Salespersons are requested to advise the customer to confirm that appropriate tightening torque is obtained by measuring the torque with an appropriate torque wrench or torque driver at the beginning of the tightening operations, and as necessary during the tightening operations. In addition, the torque values shown in Para. 7-3-2 above are useful as a handy reference, and may be utilized as tentative standards.

(1) Voltage of battery

Tightening torque is affected by the voltage output of the battery. For example, the relationship between tightening torque and the number of M16 x 55 mm (5/8" x 2-5/32") F10T bolts tightened is shown in Fig. 7 below. As can be seen in the graph, tightening torque decreases as the number of bolts tightened increases. This phenomenon is caused by the decline in voltage output of the battery due to the increasing number of bolts tightened. In particular, the tightening torque decreases rapidly just before the battery is fully discharged (range "a" in the graph). As this phenomenon is an inherent drawback in any cordless impact driver, salespersons are requested to ensure that the customer is fully aware of and understands this characteristic.

Model WR 12DM

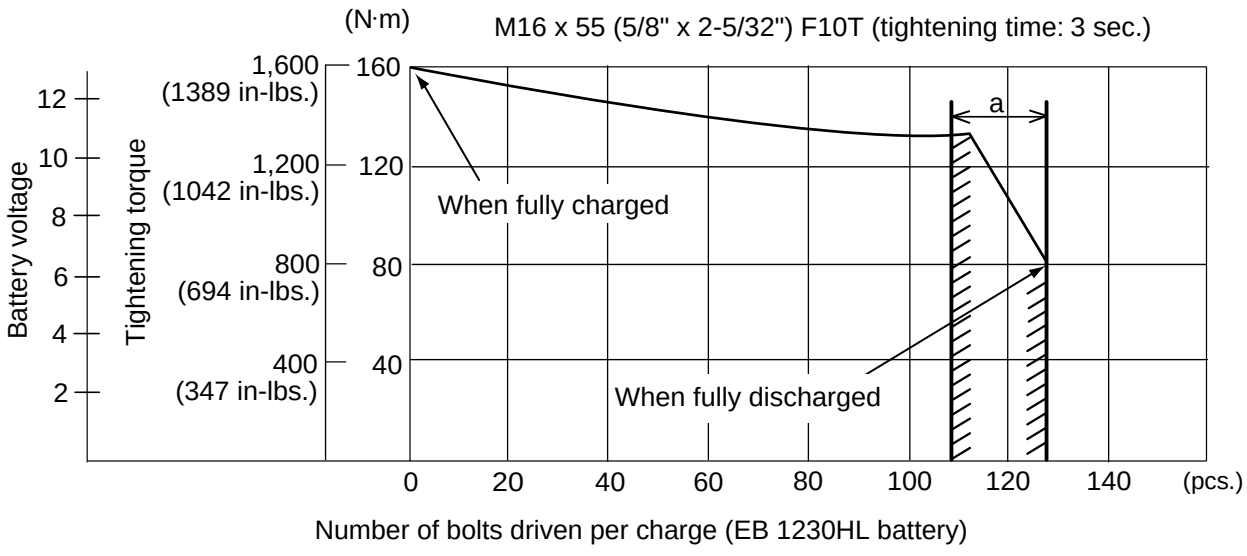



**Fig. 7**

(2) Effects of low ambient temperatures

The tightening torque required may be reduced at low ambient temperatures or under the influence of grease and different torque coefficients (dependent on manufacturing and finishing processes, and specified by bolt manufacturers).

(3) Different bolt diameter

Differences in bolt diameter will cause variation of the required levels of tightening torque. Generally speaking, tightening torque is higher for large bolts.

(4) Different materials being tightened

When a bolt is tightened into a soft material such as aluminum, plastic, wood, etc., the tightening torque is considerably less than when the bolt is tightened into a hard material such as steel.

(5) Different tightening conditions

The tightening torque may vary in accordance with bolt torque coefficient (dependent on manufacturing process, and specified by bolt manufactures), bolt grade and bolt length, even though the dimensions of the bolts are the same. Tightening torque may also vary depending on the surface finishing state of tightening materials (steel, aluminum, etc.), and materials to be tightened. In addition, if there is seal packing, clearance, etc., between tightening materials, the tightening torque is decreased.

(6) Wear and looseness of the socket

With extended use, the hexagonal portion of the socket which is fitted to the head of the bolt or drill bit, and/or hexagonal portion of the driver chuck which is fitted onto the anvil in the main body will become worn and loose. Wear and looseness will cause a proportionate loss of tightening torque.

In addition, use of an incorrect size socket (slightly larger than the bolt being tightened) will also result in decreased torque.

(7) Bolt and nut rotate together

Tightening torque that can be achieved will be considerably decreased if the bolt and nut rotate together during the tightening operation. The customer should be advised to carefully observe the operation and ensure this does not occur.

**8-4. Suggestions and Precautions for the Efficient Use of the Charger**

(1) Batteries may not be rechargeable immediately after use

If the Models EB 1220BL and EB 1230HL Storage Batteries are exposed to direct sunshine for an extended period, or if the temperature of the batteries is 40 ˚C (104 ˚F) or higher immediately after they have been used in the tool, the pilot lamp may not light up when the batteries are connected to the Model UC 14YF2 Charger. This is because the built-in thermostat functions to stop the charging when the temperature of the storage batteries reach 40 ˚C (104 ˚F) or more. In such a case, the customer should be advised to place the batteries in a shaded area with a good airflow, and allow sufficient cooling before recharging.

This phenomenon is common to all existing batteries which employ temperature sensitive overcharge devices. The cooling time required before charging can be accomplished varies from a few minutes to about 30 minutes, depending on the load, duration of use, and ambient temperature.

## 9. OTHER PRECAUTIONS

(1) Check for cracks or other damage on the socket

Cracks or any other faults on the socket are very hazardous. In addition, cracks or other damage to accessories will cause loss of tightening torque efficiency. Advise the customer to inspect accessories often, and ensure there are no abnormalities.

(2) Socket dimensions

Without fail, utilize an appropriate socket which matches the bolt and/or nut dimensions. If the socket dimensions are larger than the bolts or nuts, it will not only cause insufficient tightening torque, but could also easily cause damage to the socket. Please refer to the tables in Para. 6-2 for appropriate socket dimensions.

(3) Hammering section lubrication

Grease (ATTOLUB MS No. 2) is utilized in the hammering section. Frequent or continuous use of the tool will cause excessive temperature rise of the hammering section, resulting in depletion of the grease and subsequent increased wear of components which will, in turn, cause loss of tightening efficiency. Accordingly, it is necessary to periodically replenish the grease in the hammering section to ensure proper lubrication of moving and sliding components.

(4) Vent holes in the handle

Do not stop up or cover the holes on either face of the handle. They are essential for ventilation.

## 10. REPAIR GUIDE

**WARNING: Without fail, remove the Model EB 1220BL or EB 1230HL Battery from the main body before starting repair or maintenance work. Because the tool is cordless, if the battery is left in and the switch is activated inadvertently, the motor will start rotating unexpectedly, which could cause serious injury.**

### 10-1. Precautions in Disassembly and Reassembly

The **[bold]** and **<bold>** numbers correspond to the item numbers in the Parts List and the exploded assembly diagram. ( **[ ]**: WH 12DM, **< >**: WR 12DM )

#### 10-1-1. Disassembly

(1) Removal of Guide Sleeve (A) **[4]** (Model WH 12DM only)

Remove the Retaining Ring **[1]**, Washer (D) **[2]**, Guide Spring **[3]** and Guide Sleeve (A) **[4]** in order by following the procedure shown in Figs. 8-1 to 8-4. Be sure not to lose the two Steel Balls D3.5 **[8]** in Anvil (C) **[9]**.

1

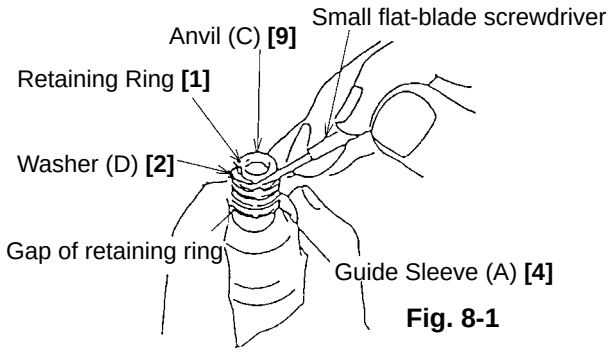



**Fig. 8-1**

Hold the body and adjust the gap of the retaining ring to the groove of anvil (C), then insert a small flat-blade screwdriver into the groove at an angle.

2

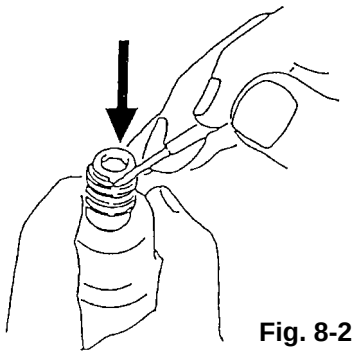


**Fig. 8-2**

Press down the Washer (D) with the small flat-blade screwdriver.

3

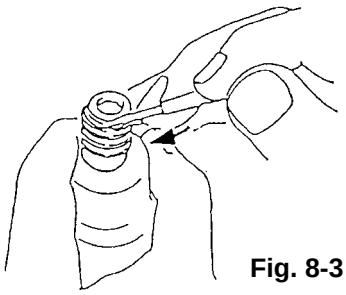


**Fig. 8-3**

Slide the small flat-blade screwdriver under one side of the gap of the retaining ring.

4

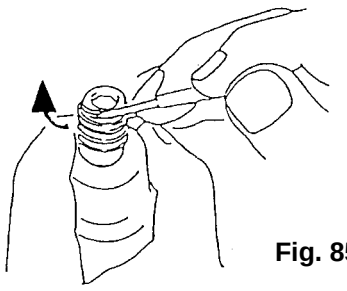


**Fig. 85-4**

Slowly raise the retaining ring using the end face of guide sleeve (A) as a fulcrum.

Then slowly raise the other side of the retainer ring with the small flat-blade screwdriver until it is free. Avoid quickly raising the retainer ring or it may fly out forcefully.

(2) Removal of the Hammer Case **[7] <3>** and the hammer assembly

Remove the four Tapping Screws (W/SP. Washer) D4 x 25 (Black) **[6] <2>** that connect the Hammer Case **[7] <3>** with Housing (A). (B) Set **[33] <30>** and remove the Hammer Case **[7] <3>** and the hammer assembly from Housing (A).(B) Set **[33] <30>**.

(3) Disassembly of the hammer assembly

Mount the hammer assembly onto the J-297 base for washer (S). With a hand press, push down the top of the Spindle **[17] <14>** to compress the Hammer Spring **[14] <11>**. In this position, remove the Stopper **[16] <13>** with a flat-blade screwdriver, then release the hand press. (See Fig. 9.)

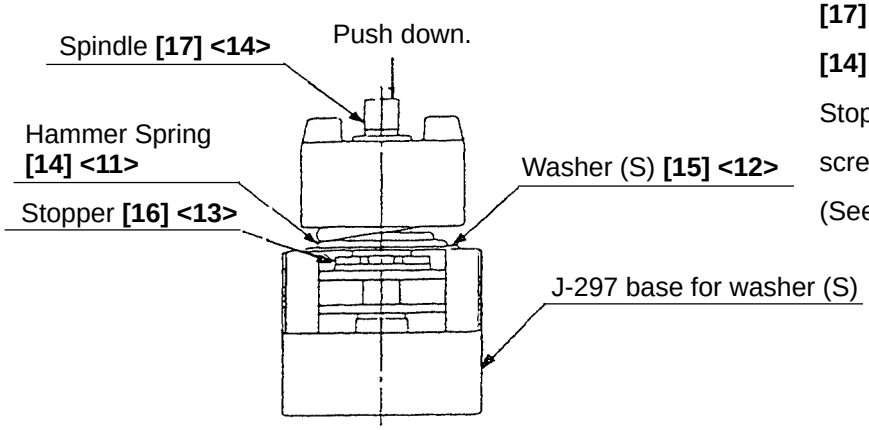



**Fig. 9**

Remove the hammer assembly from the J-297 base for washer (S) and support the end surface of the Spindle **[17] <14>**. With a hand press, push down either of the raised faces of Hammer **[11] <8>** to compress the Hammer Spring **[14] <11>**. In this position, extract the two Steel Balls D5.556 **[10] <7>** from the cam grooves of the Spindle **[17] <14>** and Hammer **[11] <8>** with a small flat-blade screwdriver or a similar tool. Then, slowly release the hand press and lift Hammer **[11] <8>** and Washer (S) **[15] <12>** together to extract them from the Spindle **[17] <14>**. The Hammer Spring **[14] <11>** can then be removed.

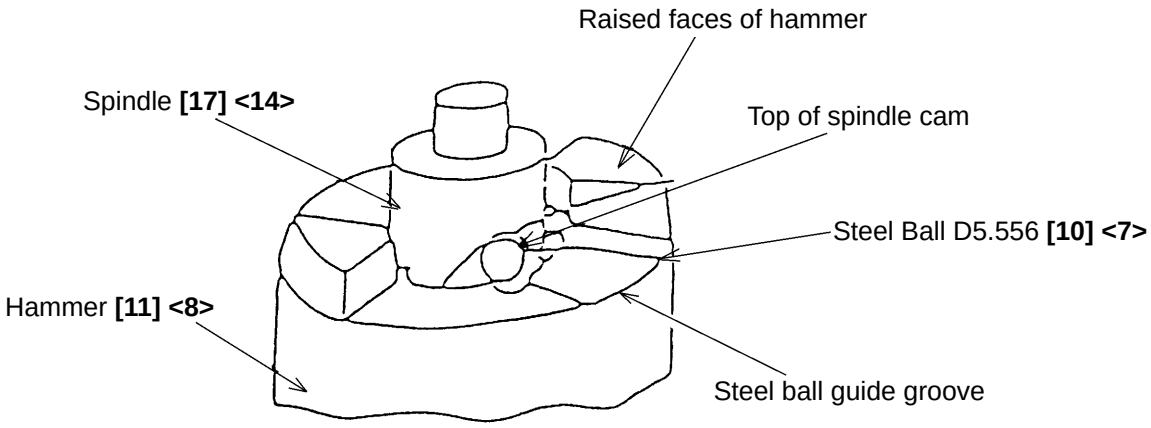



**Fig. 10**

(4) Removal of the Carbon Brushes 5 x 6 x 11.5 **[29] <26>**

Remove the two Brush Caps **[30] <27>**. Catch the flanges of the Carbon Brushes 5 x 6 x 11.5 **[29] <26>** with a small flat-blade screwdriver or a similar tool and remove the Carbon Brushes **[29] <26>** at both sides.

(5) Removal of the Hook Ass'y **[39] <36>**

Remove the Special Screw M5 **[43] <40>** with a flat-blade screwdriver or a coin and remove the Hook Ass'y **[39] <36>** and the Hook Spring **[42] <39>**.

(6) Removal of Housing (B)

Remove the seven Tapping Screws (W/Flange) D4 x 20 (Black) **[31] <28>** from the main body. Before removing Housing (B), be sure to remove the Brush Caps **[30] <27>** because Housing (B) cannot be removed if the Brush Caps **[30] <27>** are mounted.

(7) Remove the FET of the DC-Speed Control Switch **[36] <33>** from the Dust Guard Fin **[27] <24>**. Then, the Inner Cover **[24] <21>**, Armature ass'y **[25] <22>**, Magnet **[26] <23>**, Brush Block **[28] <25>** and DC-Speed Control Switch **[36] <33>** can be removed in a piece. The Pushing Button **[37] <34>** and the Strap **[41] <38>** can also be removed.

(8) Removal of the switch assembly

Remove the two Machine Screws (W/SP. Washer) M3 x 5 **[35] <32>** that secure the flag terminal and then disconnect the internal wires (purple and black) of the Brush Block **[28] <25>** from the DC-Speed Control Switch **[36] <33>**.

**(Note)** Do not disconnect the three FET internal wires soldered to the DC-Speed Control Switch.

(9) Removal of the Magnet **[26] <23>** and the Dust Guard Fin **[27] <24>**

Remove the Magnet **[26] <23>** in the "B" direction (see Fig. 8) holding the Inner Cover **[24] <21>** securely because the Magnet **[26] <23>** has a strong magnetism. The Dust Guard Fin **[27] <24>** can be easily removed from the Magnet **[26] <23>** by pulling it in the "B" direction (see Fig. 11) because it is mounted to the Magnet **[26] <23>** magnetically.

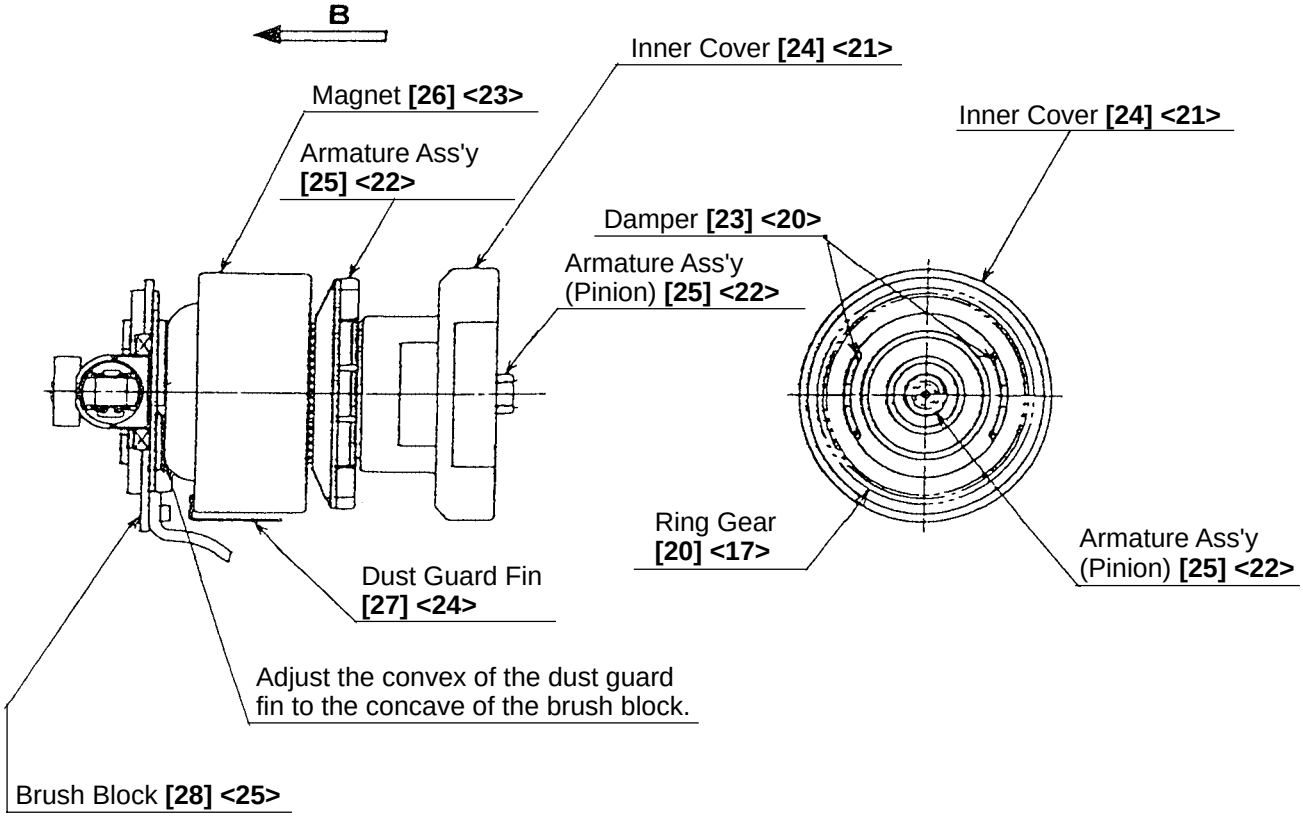



**Fig.11**

(10) Removal of the Armature Ass'y **[25] <22>**

Support the Inner Cover **[24] <21>** so that it does not contact the fan of the Armature Ass'y **[25] <22>**. With a hand press, push down the tip portion of Armature Ass'y (pinion) **[25] <22>** to remove it.

(11) Removal of the Ring Gear **[20] <17>** and the Damper **[23] <20>**

Remove the Ring Gear **[20] <17>** from the Inner Cover **[24] <21>** and remove the Damper **[23] <20>** with a small flat-blade screwdriver.

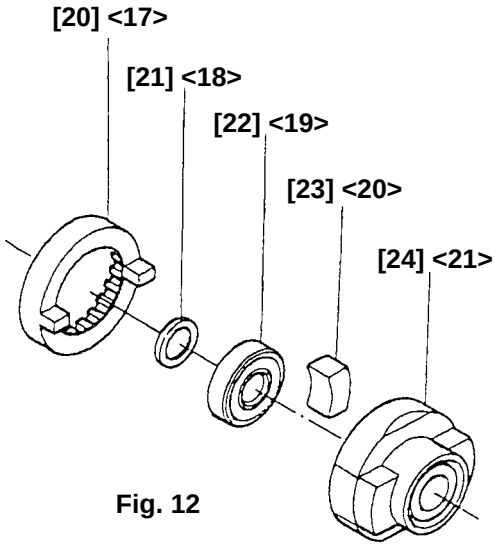



**Fig. 12**

**10-1-2. Reassembly**

Reassembly can be accomplished by following the disassembly procedures in reverse. However, special attention should be given to the following items.

(1) Reassembly of the housing assembly

(a) Be sure to follow the wiring diagram (Fig. 13) for proper wiring.

(b) When connecting the internal wires of the Brush Block **[28] <25>** to the DC-Speed Control Switch **[36] <33>**, fasten them with the Machine Screw (W/SP. Washer) M3 x 5 **[35] <32>** paying attention to the direction of the flag terminal (Fig. 13).

**(Note)** If the flag terminal is mounted in wrong direction, the flag terminal may be damaged due to contact with the housing. In addition, the gap between the housings (A) and (B) is widened and dust may get into the housings (A) and (B).

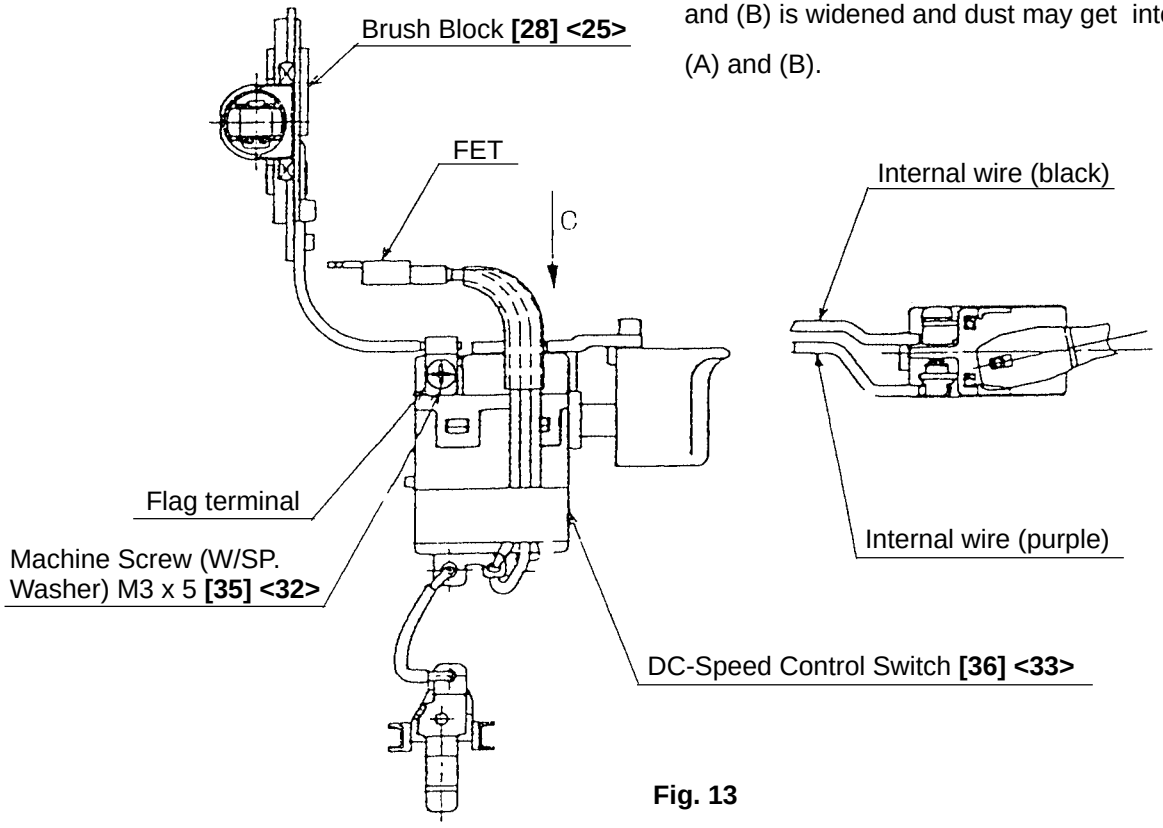



**Fig. 13**

(c) Mount a unit of the Inner Cover **[24] <21>** (including the Armature Ass'y **[25] <22>**), Magnet **[26] <23>** (including the Dust Guard Fin **[27] <24>**) and Brush Block **[28] <25>** into housing (A) (See Fig. 15). Pay attention to the following items.

- Adjust the protrusion of the Dust Guard Fin **[27] <24>** to the notch of the Magnet **[26] <23>** when mounting the Dust Guard Fin **[27] <24>** to the Magnet **[26] <23>** (See Fig. 14).
- Insert the two Dampers **[23] <18>** so that they fit into the Inner Cover **[24] <21>**. Fit the locking rib of the Ring Gear **[20] <17>** to the concave portion of the Damper **[23] <20>**. Press-fit the Armature Ass'y **[25] <22>** into the Inner Cover **[24] <21>**.
- Adjust the convex portion of the Dust Guard Fin **[27] <22>** to the concave portion of the Brush Block **[28] <25>** (See Fig. 14).
- Adjust the notch (for locking) of the Magnet **[26] <23>** to the protrusion of housing (A) (See Figs. 14 and 15).
- Position the plate of the Dust Guard Fin **[27] <24>** under the rib of Housing (A) (See Fig. 16).

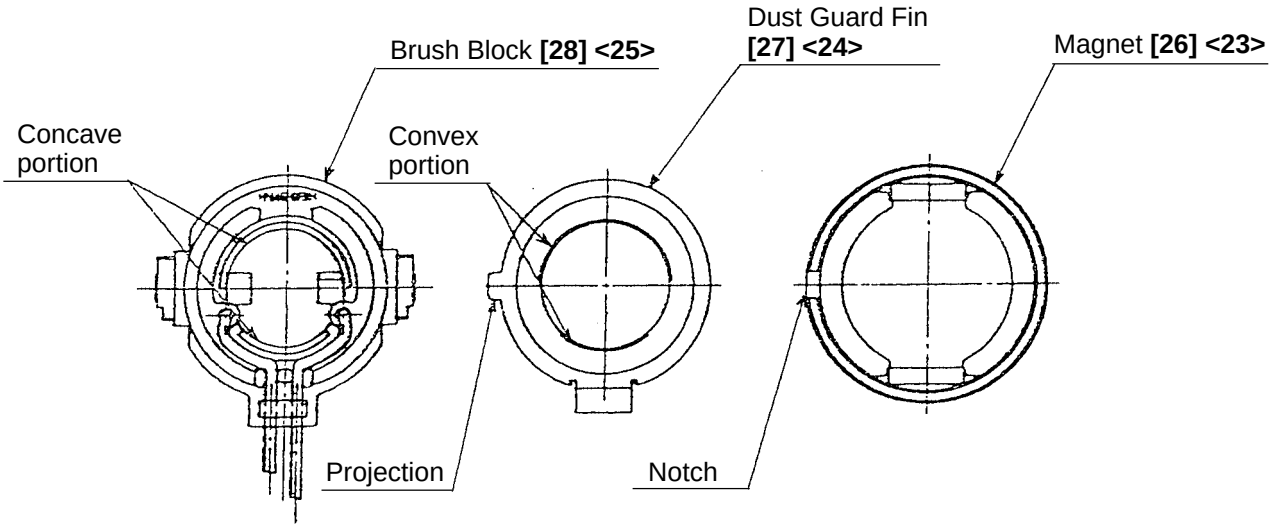



**Fig. 14**

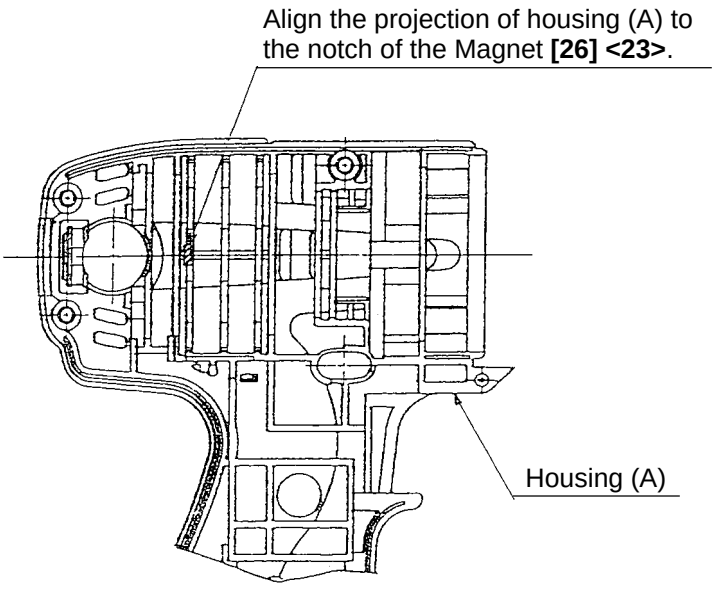



**Fig. 15**

(d) Mount the DC-Speed Control Switch **[36] <33>** to housing (A) so that the protrusion of the forward/reverse lever at the top of the switch is inserted into the U-shaped groove of the Pushing Button **[37] <34>**. Apply silicone grease (KS609, Shin-Etsu Chemical Co., Ltd.) to the contacting surfaces of the FET of the DC-Speed Control Switch **[36] <33>** and the Dust Guard Fin **[27] <24**> then mount them to housing (A).

(Note) The temperature of the FET may be high if the silicone grease is not applied. Make sure that the three internal wires from the FET are passed above the DC-Speed Control Switch **[36] <33>** (see Fig. 16).

(2) Mount the Strap **[41] <38>** to housing (A) and apply silicone rubber (ThreeBond 1211) to housing (A) as shown in Fig. 16. Mount housing (B) to housing (A) and secure them with seven Tapping Screws (W/Flange) D4 x 20 (Black) **[31] <28>**. Wipe the silicone rubber coming out of the housing with a cloth.

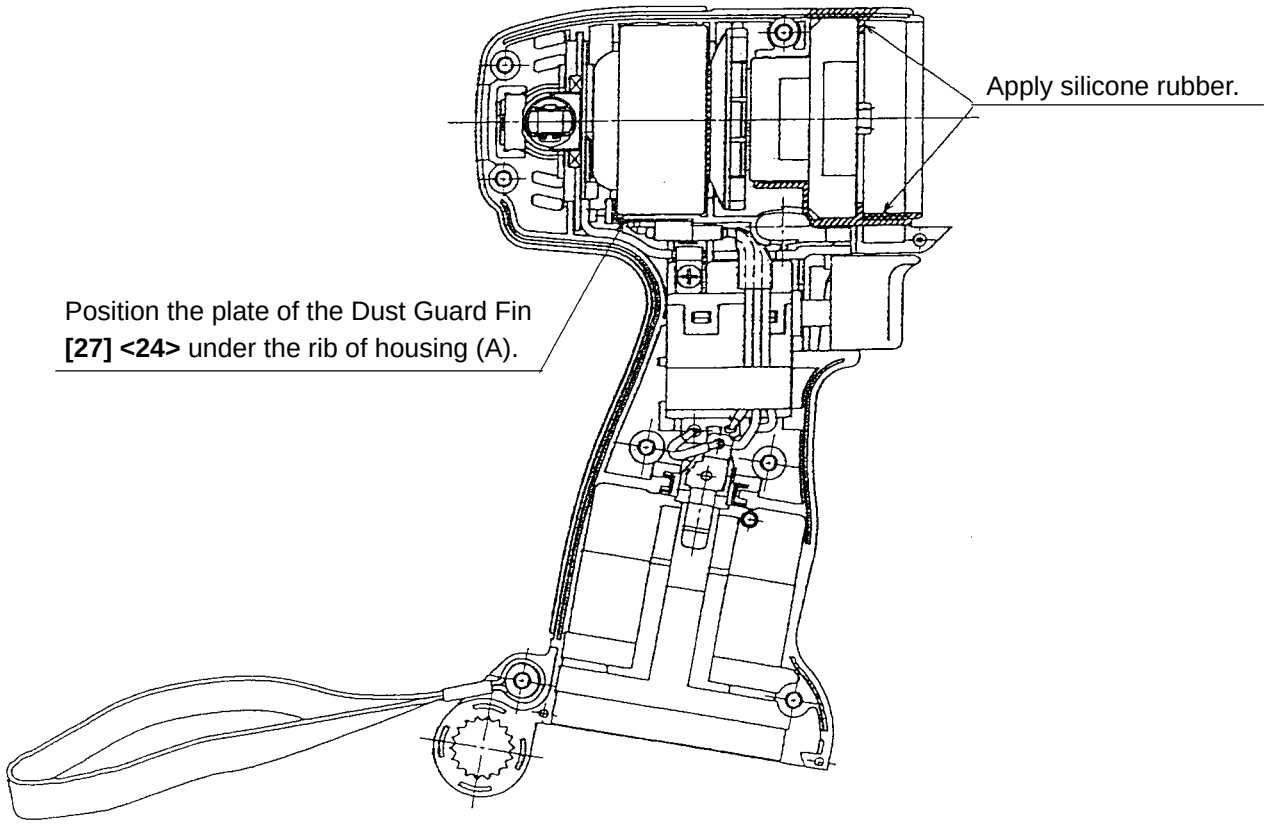



**Fig. 16**

(3) Mounting the mechanical parts

(a) Put Washer (S) **[15] <12>** onto the shaft of the Spindle **[17] <14>** and mount the Hammer **[11] <8>** containing the twenty-eight Steel Balls D3.175 **[12] <9>**, Washer (J) **[13] <10>** and the Hammer Spring **[14] <11>** to the Spindle **[17] <14>**.

(b) Align the top of the cam groove on the Spindle **[17] <14>** with the steel ball guide groove on the Hammer **[11] <8>** as illustrated in Fig. 10. Press down either of the raised faces of the Hammer **[11] <8>** with a hand press to compress the Hammer Spring **[14] <11>** until the end surface of the hammer contacts the Spindle **[17] <14>**.

(c) Insert the two Steel Balls D5.556 **[10] <7>** into the steel ball guide groove. Check that the steel balls are properly inserted in the cam groove. Then release the hand press.

(d) Mount the hammer assembly onto the J297 base for washer (S). With a hand press, push down the top of the Spindle **[17] <14>** to compress the Hammer Spring **[14] <11>**. On this condition, mount the Stopper **[16] <13>** onto the spindle shaft and then release the hand press.

(4) Mounting the hammer assembly to the housing

Raise the housing assembled in step (2) and mount the hammer assembly to the housing being careful of proper engagement between the Idle Gear Set **[18] <15>** of the hammer assembly (check that Washer (E) **[21] <18>** is mounted on the Spindle **[17] <14>**) and the Ring Gear **[20] <17>**. After mounting, check that the hammer assembly turns. If the hammer assembly does not turn, the gears engage improperly.

(5) Mounting the hammer case

Put Anvil (C) **[9]** or Anvil (L) Ass'y **<6>** on the Spindle **[17] <14>**. Cover it with the Hammer Case **[7] <3>** and secure with the four Tapping Screws (W/SP. Washer) D4 x 25 (Black) **[6] <2>**.

(6) Mounting Guide Sleeve (A) **[4]** (WH 12DM only)

Insert the two Steel Balls D3.5 **[8]** into the hole of Anvil (C) **[9]**. Mount the Guide Sleeve (A) **[4]**, Guide Spring **[3]** and Washer (D) **[2]** in sequence. Mount the Retaining Ring **[1]** into the groove of anvil using the J295 jigs (A) and (B) for retaining ring as illustrated in Fig. 17.

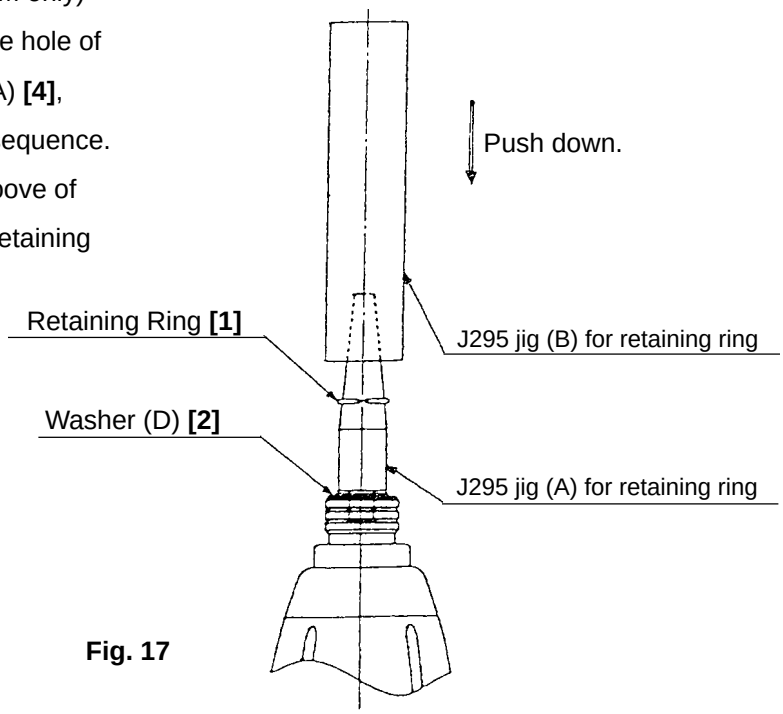



**Fig. 17**

(7) Reassembly of the hook

Check that the V-Lock Nut M5 **[40] <37>** is mounted into the Hook Ass'y **[39] <36>**. Mount the Hook Spring **[42] <39>** and secure it with the Special Screw M5 **[43] <40>**. (Make sure to mount the Hook Spring **[42] <39>** with its larger diameter side pointing inward the housing.)

(8) Checking the direction of rotation

Check whether the direction of rotation of Anvil (C) **[9]** or Anvil (L) Ass'y **<6>** coincides with the directional markings on the push-on side of the Pushing Button **[37] <34>**. When the Pushing Button **[37] <34>** is turned to (R) side, the direction of rotation of Anvil (C) **[9]** or Anvil (L) Ass'y **<6>** should be clockwise, as viewed from behind.

(9) Lubrication

(a) ATTOLUB MS No. 2

- Cam groove and sliding section of the Spindle **[17] <14>**
- Cam groove and oil groove of the Hammer **[11] <8>**
- 8 mm diameter hole of Anvil (C) **[9]** or Anvil (L) Ass'y **<6>**, sliding section between Anvil (C) **[9]** or Anvil (L) Ass'y **<6>** and the metal, and upper surface of the claw
- Two Steel Balls D5.556 **[10] <7>**
- Pinion tooth flanks of the Armature Ass'y **[25] <22>**, tooth flanks of the Ring Gear **[20] <17>**, tooth flanks of the Idle Gear Set (2 pcs.) **[18] <15>**
- Metal oil groove of the Hammer Case **[7] <3>**
- Twenty-eight Steel Balls D3.175 **[12] <9>**

(b) HITACHI MOTOR GREASE No. 29 (WH 12DM only)

- Two Steel Balls D3.5 **[8]**
- Sliding section between Anvil (C) **[9]** and Guide Sleeve (A) **[4]**

(c) MOLUB-ALLOY 777-1

- All around the Needle Roller **[19] <16>**
- 5 mm diameter hole of Idle Gear Set (2 pcs.) **[18] <15>**

(10) Screw tightening torque

- Tapping Screw (W/SP. Washer) D4 x 25 (Black) **[6] <2>** ··· 1.96 ± 0.49 N·m (20 ± 5 kgf·cm, 17.4 ± 4.3 in-lbs.)
- Tapping Screw (W/Flange) D4 x 20 (Black) **[31] <28>** ····· 1.96 ± 0.49 N·m (20 ± 5 kgf·cm, 17.4 ± 4.3 in-lbs.)
- Machine Screw (W/SP. Washer) M3 x 5 **[35] <32>**····· 0.29 ─ 0.39 N·m (3 ─ 4 kgf·cm, 2.6 ─ 3.5 in-lbs.)
- Special Screw M5 **[43] <40>** ····· 1.96 ± 0.49 N·m (20 ± 5 kgf·cm, 17.4 ± 4.3 in-lbs.)
- Brush cap **[30] <27>** ····· 0.78 ± 0.10 N·m (8 ± 1 kgf·cm, 6.9 ± 0.9 in-lbs.)

**10-2. Precautions in Disassembly and Reassembly of Battery Charger**

Refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Model UC 14YF2 Battery Charger.

## 11. STANDARD REPAIR TIME (UNIT) SCHEDULES

| MODEL | Variable / Fixed | 10 | 20 | 30 | 40 | 50 | 60 min. |
|---|---|---|---|---|---|---|---|
| WH 12DM<br>WR 12DM | | Work Flow | | | | | |
| | | DC-Speed Control Switch | | Housing (A).(B) Set | | | |
| | | | Inner Cover<br>Armature Ass'y<br>Magnet<br>Brush Block | | | | |
| | General Assembly | | Hammer Case<br>Washer<br>Anvil (B)<br>Ring Gear | Steel Ball<br>Hammer<br>Washer<br>Hammer Spring<br>Spindle<br>Idle Gear Set<br>Needle Roller<br>Ball Bearing (6901VV) | | | |

HITACHI

LIST NO. F862

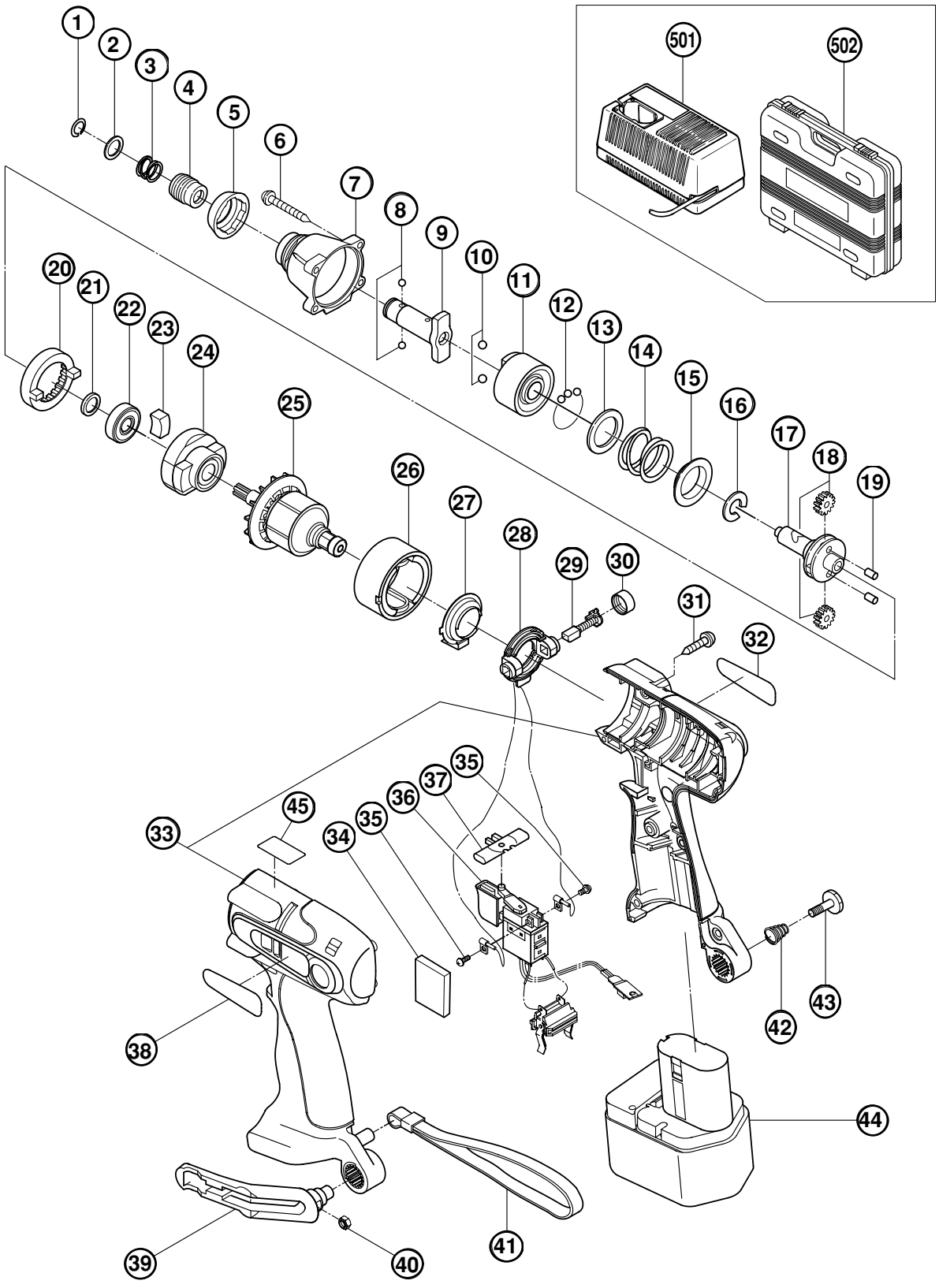
# ELECTRIC TOOL PARTS LIST

## ■ CORDLESS IMPACT DRIVER

**2001・10・5**

## Model WH 12DM

**(E1)**



| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 1 | 315-984 | RETAINING RING | 1 | | |
| | 2 | 315-983 | WASHER (D) | 1 | | |
| | 3 | 315-982 | GUIDE SPRING | 1 | | |
| | 4 | 319-921 | GUIDE SLEEVE (A) | 1 | | |
| | 5 | 320-418 | FRONT CAP | 1 | | |
| | 6 | 319-917 | TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK) | 4 | | |
| | 7 | 319-923 | HAMMER CASE | 1 | | |
| | 8 | 319-535 | STEEL BALL D3.5 (10 PCS.) | 2 | | |
| | 9 | 320-417 | ANVIL (C) | 1 | | |
| | 10 | 959-154 | STEEL BALL D5.556 (10 PCS.) | 2 | | |
| | 11 | 319-916 | HAMMER | 1 | | |
| | 12 | 959-148 | STEEL BALL D3.175 (10 PCS.) | 28 | | |
| | 13 | 315-978 | WASHER (J) | 1 | | |
| | 14 | 319-915 | HAMMER SPRING | 1 | | |
| | 15 | 316-172 | WASHER (S) | 1 | | |
| | 16 | 316-171 | STOPPER | 1 | | |
| | 17 | 319-912 | SPINDLE | 1 | | |
| | 18 | 319-913 | IDLE GEAR SET (2 PCS.) | 2 | | |
| | 19 | 319-914 | NEEDLE ROLLER | 2 | | |
| | 20 | 319-910 | RING GEAR | 1 | | |
| | 21 | 319-911 | WASHER (E) | 1 | | |
| | 22 | 690-1VV | BALL BEARING 6901VVCMPS2L | 1 | | |
| | 23 | 319-909 | DAMPER | 2 | | |
| | 24 | 319-908 | INNER COVER | 1 | | |
| | 25 | 360-557 | ARMATURE ASS'Y (W/BALL BEARING) DC 12V | 1 | | |
| | 26 | 319-919 | MAGNET | 1 | | |
| | 27 | 319-907 | DUST GUARD FIN | 1 | | |
| | 28 | 319-905 | BRUSH BLOCK | 1 | | |
| | 29 | 999-054 | CARBON BRUSH 5X6X11.5 (1 PAIR) | 2 | | |
| | 30 | 319-918 | BRUSH CAP | 2 | | |
| | 31 | 302-086 | TAPPING SCREW (W/FLANGE) D4X20 (BLACK) | 7 | | |
| * | 32 | | NAME PLATE | 1 | | |
| | 33 | 320-381 | HOUSING (A).(B) SET | 1 | | |
| | 34 | 316-186 | SUPPORT (B) | 1 | | |
| | 35 | 994-532 | MACHINE SCREW (W/SP. WASHER) M3X5 | 2 | | |
| | 36 | 319-906 | DC-SPEED CONTROL SWITCH | 1 | | |
| | 37 | 316-166 | PUSHING BUTTON | 1 | | |
| | 38 | | HITACHI LABEL | 1 | | |
| | 39 | 320-287 | HOOK ASS'Y | 1 | INCLUD.40 | |
| | 40 | 320-288 | V-LOCK NUT M5 | 1 | | |
| | 41 | 306-952 | STRAP (BLACK) | 1 | | |
| | 42 | 319-926 | HOOK SPRING | 1 | | |
| | 43 | 319-927 | SPECIAL SCREW M5 | 1 | | |
| * | 44 | 320-387 | BATTERY EB 1220BL (W/ENGLISH N.P.) | 1 | | |
| * | 44 | 320-386 | BATTERY EB 1220BL (W/ENGLISH N.P.) | 1 | FOR USA,CAN | |
| * | 44 | 320-388 | BATTERY EB 1230HL (W/ENGLISH N.P.) | 1 | | |
| * | 45 | | CAUTION PLATE | 1 | FOR USA | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## STANDARD ACCESSORIES

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| 501 | | CHARGER (MODEL UC 14YF2) | 1 | | |
| 502 | 320-377 | CASE | 1 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## OPTIONAL ACCESSORIES

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| * 601 | 310-378 | BATTERY EB 12B (W/ENGLISH N.P.) | 1 | | |
| * 601 | 310-453 | BATTERY EB 12B (W/ENGLISH N.P.) | 1 | FOR USA,CAN | |
| * 601 | 316-665 | BATTERY EB 12H (W/ENGLISH N.P.) | 1 | | |
| 602 | 992-671 | + DRIVER BIT (B) NO.2 50L | 1 | | |
| 603 | 992-672 | + DRIVER BIT (B) NO.3 50L | 1 | | |
| 604 | 996-177 | NON-MAGNETIC HEX. SOCKET 8MM 65L | 1 | | |
| 605 | 985-329 | NON-MAGNETIC HEX. SOCKET 10MM 65L | 1 | | |
| 606 | 996-178 | NON-MAGNETIC HEX. SOCKET 12MM 65L | 1 | | |
| 607 | 996-179 | NON-MAGNETIC HEX. SOCKET 13MM 65L | 1 | | |
| 608 | 996-180 | NON-MAGNETIC HEX. SOCKET 14MM 65L | 1 | | |
| 609 | 996-181 | NON-MAGNETIC HEX. SOCKET 16MM 65L | 1 | | |
| 610 | 996-182 | NON-MAGNETIC HEX. SOCKET 17MM 65L | 1 | | |
| 611 | 996-197 | HEX. SOCKET (LONG) 21MMX166L | 1 | | |
| 612 | 996-195 | DRILL CHUCK AND ADAPTER SET | 1 | INCLUD.613,614 | |
| 613 | 930-119 | CHUCK WRENCH 6.5G | 1 | | |
| 614 | 307-543 | CHUCK ADAPTER | 1 | | |
| 615 | 309-922 | GREASE FOR IMPACT DRIVER (500G) | 1 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

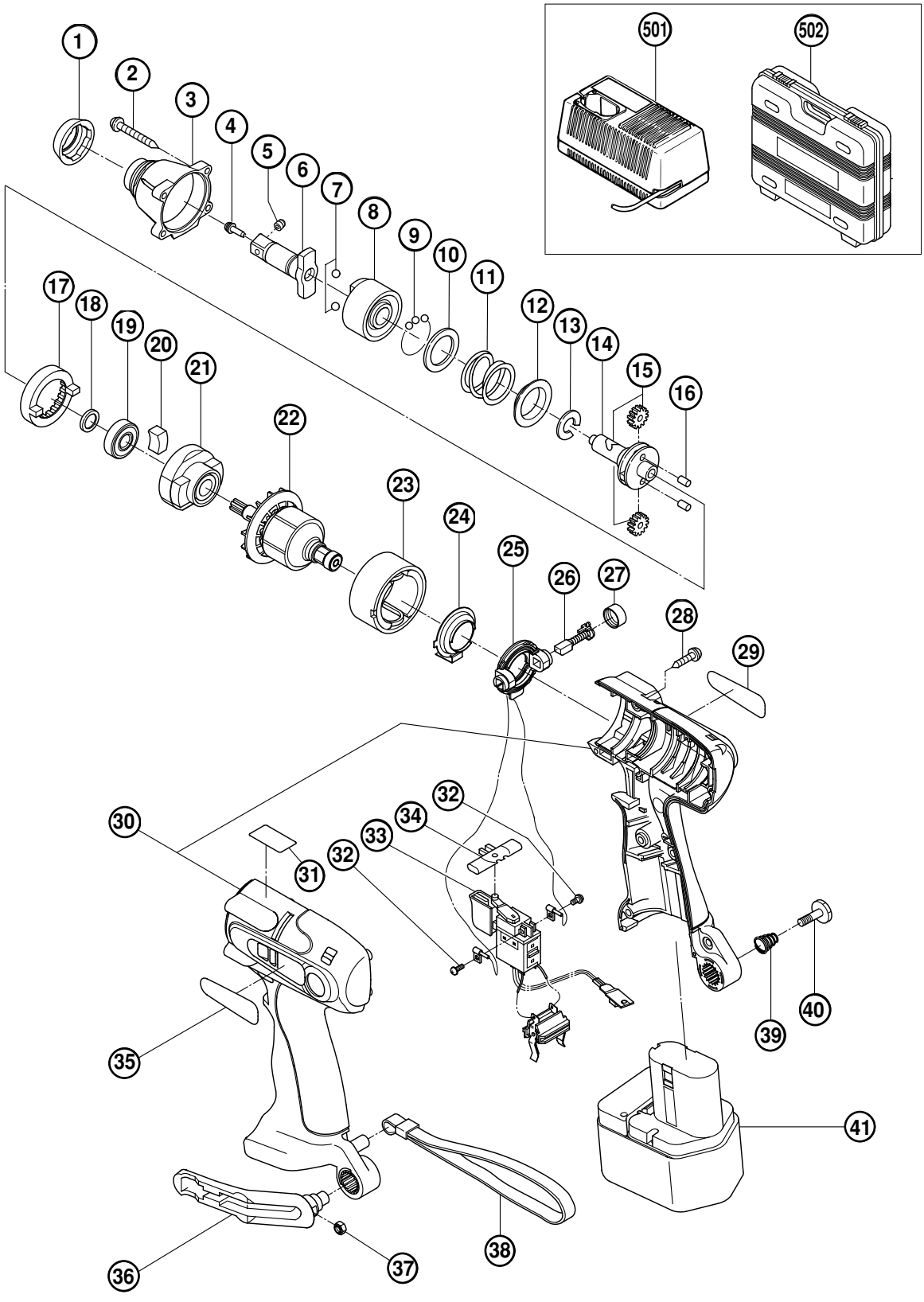
HITACHI

LIST NO. F864

# ELECTRIC TOOL PARTS LIST

## ■ CORDLESS IMPACT WRENCH 2001・10・25

## Model WR 12DM (E1)



| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 1 | 320-383 | FRONT CAP | 1 | | |
| | 2 | 319-917 | TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK) | 4 | | |
| | 3 | 320-382 | HAMMER CASE | 1 | | |
| | 4 | 985-209 | PIN RETAINER | 1 | | |
| | 5 | 985-208 | PLUNGER | 1 | | |
| | 6 | 320-384 | ANVIL (L) ASS'Y | 1 | INCLUD.4,5 | |
| | 7 | 959-154 | STEEL BALL D5.556 (10 PCS.) | 2 | | |
| | 8 | 319-916 | HAMMER | 1 | | |
| | 9 | 959-148 | STEEL BALL D3.175 (10 PCS.) | 28 | | |
| | 10 | 315-978 | WASHER (J) | 1 | | |
| | 11 | 319-915 | HAMMER SPRING | 1 | | |
| | 12 | 316-172 | WASHER (S) | 1 | | |
| | 13 | 316-171 | STOPPER | 1 | | |
| | 14 | 319-912 | SPINDLE | 1 | | |
| | 15 | 319-913 | IDLE GEAR SET (2 PCS.) | 2 | | |
| | 16 | 319-914 | NEEDLE ROLLER | 2 | | |
| | 17 | 319-910 | RING GEAR | 1 | | |
| | 18 | 319-911 | WASHER (E) | 1 | | |
| | 19 | 690-1VV | BALL BEARING 6901VVCMPS2L | 1 | | |
| | 20 | 319-909 | DAMPER | 2 | | |
| | 21 | 319-908 | INNER COVER | 1 | | |
| | 22 | 360-557 | ARMATURE ASS'Y (W/BALL BEARING) DC 12V | 1 | | |
| | 23 | 319-919 | MAGNET | 1 | | |
| | 24 | 319-907 | DUST GUARD FIN | 1 | | |
| | 25 | 320-376 | BRUSH BLOCK | 1 | | |
| | 26 | 999-054 | CARBON BRUSH 5X6X11.5 (1 PAIR) | 2 | | |
| | 27 | 319-918 | BRUSH CAP | 2 | | |
| | 28 | 302-086 | TAPPING SCREW (W/FLANGE) D4X20 (BLACK) | 7 | | |
| * | 29 | | NAME PLATE | 1 | | |
| | 30 | 320-381 | HOUSING (A).(B) SET | 1 | | |
| * | 31 | | CAUTION PLATE | 1 | FOR USA | |
| | 32 | 994-532 | MACHINE SCREW (W/SP. WASHER) M3X5 | 2 | | |
| | 33 | 319-906 | DC-SPEED CONTROL SWITCH | 1 | | |
| | 34 | 316-166 | PUSHING BUTTON | 1 | | |
| | 35 | | HITACHI LABEL | 1 | | |
| | 36 | 320-378 | HOOK ASS'Y | 1 | INCLUD.37 | |
| | 37 | 320-288 | V-LOCK NUT M5 | 1 | | |
| | 38 | 306-952 | STRAP (BLACK) | 1 | | |
| | 39 | 319-926 | HOOK SPRING | 1 | | |
| | 40 | 319-927 | SPECIAL SCREW M5 | 1 | | |
| * | 41 | 320-387 | BATTERY EB 1220BL (W/ENGLISH N.P.) | 2 | | |
| * | 41 | 320-386 | BATTERY EB 1220BL (W/ENGLISH N.P.) | 1 | FOR USA,CAN | |
| * | 41 | 320-388 | BATTERY EB 1230HL (W/ENGLISH N.P.) | 1 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## STANDARD ACCESSORIES

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| 501 | | CHARGER (MODEL UC 14YF2) | 1 | | |
| 502 | 320-377 | CASE | 1 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## OPTIONAL ACCESSORIES

| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| * | 601 | 310-378 | BATTERY EB 12B (W/ENGLISH N.P.) | 1 | | |
| * | 601 | 310-452 | BATTERY EB 12B (W/ENGLISH N.P.) | 1 | FOR NZL,AUS | |
| * | 601 | 310-453 | BATTERY EB 12B (W/ENGLISH N.P.) | 1 | FOR USA,CAN | |
| | 602 | | CORNER ATTACHMENT ASS'Y | 1 | INCLUD.603-619 | |
| | 603 | 955-300 | HOUSING | 1 | | |
| | 604 | 955-301 | METAL | 3 | | |
| | 605 | 955-302 | SPINDLE | 1 | | |
| | 606 | | HITACHI LABEL | 1 | | |
| | 607 | 955-303 | BEARING RACE | 2 | | |
| | 608 | 955-304 | NEEDLE THRUST BEARING (NTA-1413) | 2 | | |
| | 609 | 955-305 | COVER | 1 | | |
| | 610 | 955-306 | NEEDLE BEARING (NTN BK1012) | 1 | | |
| | 611 | 948-227 | RETAINING RING FOR D47 HOLE | 1 | | |
| | 612 | 955-307 | PINION | 1 | | |
| | 613 | 955-308 | SLEEVE | 1 | | |
| | 614 | 955-309 | WASHER | 1 | | |
| | 615 | 955-310 | SOCKET COVER | 1 | | |
| | 616 | 955-311 | SOCKET | 1 | | |
| | 617 | 303-247 | SEAL LOCK HEX. SOCKET HD. BOLT M5X25 | 6 | | |
| | 618 | 873-537 | SOCKET PIN | 1 | | |
| | 619 | 873-187 | O-RING (J1SW1516) | 1 | | |
| | 620 | 991-481 | FORM TIE SOCKET ASS'Y 11.3MMX95L | 1 | INCLUD.618,619 | |
| | 621 | 992-610 | UNIVERSAL JOINT ASS'Y | 1 | INCLUD.618,619 | |
| | 622 | 955-153 | UNIVERSAL JOINT PIN | 1 | | |
| | 623 | 991-476 | BIT ADAPTER ASS'Y | 1 | INCLUD.618,619 | |
| | 624 | 944-291 | HEX. SOCKET ASS'Y 10MMX40L | 1 | INCLUD.618,619 | |
| | 625 | 873-632 | HEX. SOCKET ASS'Y 12MMX40L | 1 | INCLUD.618,619 | |
| | 626 | 873-539 | HEX. SOCKET ASS'Y 13MMX40L | 1 | INCLUD.618,619 | |
| | 627 | 873-540 | HEX. SOCKET ASS'Y 14MMX40L | 1 | INCLUD.618,619 | |
| | 628 | 873-536 | HEX. SOCKET ASS'Y 17MMX32L | 1 | INCLUD.618,619 | |
| | 629 | 873-624 | HEX. SOCKET ASS'Y 19MMX34L | 1 | INCLUD.618,619 | |

## OPTIONAL ACCESSORIES

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| 630 | 873-626 | HEX. SOCKET ASS'Y 21MMX36L | 1 | INCLUD.618,619 | |
| 631 | 873-627 | HEX. SOCKET ASS'Y 22MMX40L | 1 | INCLUD.618,619 | |
| 632 | 955-138 | HEX. SOCKET ASS'Y (LONG) 12MMX52L | 1 | INCLUD.618,619 | |
| 633 | 955-139 | HEX. SOCKET ASS'Y (LONG) 13MMX52L | 1 | INCLUD.618,619 | |
| 634 | 955-140 | HEX. SOCKET ASS'Y (LONG) 14MMX52L | 1 | INCLUD.618,619 | |
| 635 | 955-141 | HEX. SOCKET ASS'Y (LONG) 17MMX52L | 1 | INCLUD.618,619 | |
| 636 | 955-149 | HEX. SOCKET ASS'Y (LONG) 17MMX75L | 1 | INCLUD.618,619 | |
| 637 | 955-142 | HEX. SOCKET ASS'Y (LONG) 19MMX52L | 1 | INCLUD.618,619 | |
| 638 | 955-150 | HEX. SOCKET ASS'Y (LONG) 19MMX75L | 1 | INCLUD.618,619 | |
| 639 | 955-143 | HEX. SOCKET ASS'Y (LONG) 21MMX52L | 1 | INCLUD.618,619 | |
| 640 | 955-151 | HEX. SOCKET ASS'Y (LONG) 21MMX75L | 1 | INCLUD.618,619 | |
| 641 | 991-480 | HEX. SOCKET ASS'Y (LONG) 21MMX125L | 1 | INCLUD.618,619 | |
| 642 | 955-144 | HEX. SOCKET ASS'Y (LONG) 22MMX52L | 1 | INCLUD.618,619 | |
| 643 | 986-058 | HEX. SOCKET FOR PLASTIC CONE 12MMX70L | 1 | INCLUD.618,619 | |
| 644 | 873-633 | EXTENSION BAR ASS'Y (SQUARE) 12.7MMX100L | 1 | INCLUD.618,619 | |
| 645 | 993-658 | SOCKET ASS'Y FOR DUCT 12MMX95L | 1 | INCLUD.618,619,646 | |
| 646 | 993-659 | SOCKET FOR DUCT 12MMX52L | 1 | | |
| 647 | 992-613 | SOCKET ASS'Y FOR DUCT 13MMX95L | 1 | INCLUD.618,619,648 | |
| 648 | 992-614 | SOCKET FOR DUCT 13MMX52L | 1 | | |
| 649 | 992-615 | SOCKET ASS'Y FOR DUCT 14MMX95L | 1 | INCLUD.618,619,650 | |
| 650 | 992-616 | SOCKET FOR DUCT 14MMX52L | 1 | | |
| 651 | 309-922 | GREASE FOR IMPACT DRIVER (500G) | 1 | | |

Hitachi Koki Co., Ltd.
Tokyo Japan